

1998

# Educational Technology and State Reform: Examining the First-Year Impact of Louisiana's State Technology Policy on Public School Districts.

Jeffrey Paul Gagne

*Louisiana State University and Agricultural & Mechanical College*

Follow this and additional works at: [https://digitalcommons.lsu.edu/gradschool\\_disstheses](https://digitalcommons.lsu.edu/gradschool_disstheses)

---

## Recommended Citation

Gagne, Jeffrey Paul, "Educational Technology and State Reform: Examining the First-Year Impact of Louisiana's State Technology Policy on Public School Districts." (1998). *LSU Historical Dissertations and Theses*. 6909.  
[https://digitalcommons.lsu.edu/gradschool\\_disstheses/6909](https://digitalcommons.lsu.edu/gradschool_disstheses/6909)

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact [gradetd@lsu.edu](mailto:gradetd@lsu.edu).

## INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

**The quality of this reproduction is dependent upon the quality of the copy submitted.** Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

**UMI<sup>®</sup>**

Bell & Howell Information and Learning  
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA  
800-521-0600



## **NOTE TO USERS**

**Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation in the author's university library.**

**123-125**

**UMI**



**EDUCATIONAL TECHNOLOGY AND STATE REFORM: EXAMINING  
THE FIRST-YEAR IMPACT OF LOUISIANA'S STATE TECHNOLOGY  
POLICY ON PUBLIC SCHOOL DISTRICTS**

**A Dissertation  
Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy**

**in**

**The Department of Curriculum and Instruction**

**by  
Jeffrey Paul Gagné  
B.A. English, California State University, Sacramento, 1988  
M.A. English, California State University, Sacramento, 1990  
December, 1998**

**UMI Number: 9925550**

---

**UMI Microform 9925550**  
**Copyright 1999, by UMI Company. All rights reserved.**  
**This microform edition is protected against unauthorized**  
**copying under Title 17, United States Code.**

---

**UMI**  
**300 North Zeeb Road**  
**Ann Arbor, MI 48103**

## **DEDICATION**

**To my grandparents  
Salvatore and Jenny Antonucci**



## ACKNOWLEDGMENTS

*Action without a name, a "who" attached to it, is meaningless.*

–Hannah Arendt

This will be my poor attempt to give my action name. Writing a dissertation is solitary process, and yet even in the self-imposed loneliness required to see such projects through to their completion, I was never truly alone. I would not be writing this now had it not been for the support of my family, friends, and a great advisor. So here's to all you who provided me with support, sustenance, and a swift kick when it served my best interest.

And, to Dr. Adolph Antonio – Anytime someone calls me doctor, my glass will be raised to you for re-kindling the ashes of a fire almost extinguished by despair.

## TABLE OF CONTENTS

DEDICATION .....	ii
ACKNOWLEDGMENTS .....	iii
LIST OF TABLES .....	vii
ABSTRACT .....	ix
CHAPTER ONE .....	1
INTRODUCTION .....	1
Purpose .....	3
Background .....	4
Louisiana's Current Reform Policies .....	4
Development of the State's First Technology Plan .....	7
The State Educational Technology Plan .....	7
State Legislation and Guidelines .....	9
Initial State Funding of State Educational Technology .....	11
The Grant Application Process .....	12
Review of Grant Applications .....	13
Summary .....	14
Research Questions .....	14
Significance of the Study .....	15
CHAPTER TWO .....	17
REVIEW OF THE LITERATURE .....	17
A Brief History of Education Reform .....	17
The First Wave of Reform .....	19
The Second Wave Of Reform .....	22
The Third Wave Of Reform .....	24
Implementation Reforms .....	27
Implementing Technology .....	31
Summary .....	39
CHAPTER THREE .....	43
METHODOLOGY .....	43
Introduction and Overview .....	43
Quantitative Instrumentation and Data Collection .....	43
Validity and Reliability .....	48
Quantitative Data Analysis .....	50

Case Studies .....	51
Case Study Data Analysis .....	52
<b>CHAPTER FOUR .....</b>	<b>53</b>
<b>RESULTS .....</b>	<b>53</b>
Overview .....	53
Response Rates .....	54
Louisiana State Educational Technology Survey Data: 1996-97 and 1997-98 .....	54
District Technology Levels .....	55
District Perceptions of State Technology Policy .....	57
Part One Analysis .....	57
Paired-Samples T-Test .....	57
Results .....	58
Analysis of Variance .....	59
Significant Responses .....	59
District Evaluation of Policy Measures .....	61
Ranking the Value of Policy Measures .....	62
Technology Funding and Expenditures .....	63
Open-ended Responses .....	66
Summary .....	66
<b>CHAPTER FIVE .....</b>	<b>67</b>
<b>CASE STUDIES OF THREE LOUISIANA SCHOOL DISTRICTS .....</b>	<b>67</b>
Introduction .....	67
Research Access .....	68
The Interviews .....	68
School Visits .....	69
Case Study One-Alsace Parish .....	70
The Interview .....	71
School Visits .....	73
Summary .....	75
Case Study Two-Lorraine Parish .....	76
The Interview .....	80
School Visits .....	82
Summary .....	84
Case Study Three-Bretagne Parish .....	84
The Interview .....	86
School Visits .....	88
Summary .....	90

CHAPTER SIX .....	92
DISCUSSION .....	92
Overview .....	92
Limitations of the Study .....	93
Research Question One .....	94
State Funding .....	94
Research Question Two .....	96
Research Question Three .....	97
Research Question Four .....	99
District Context .....	100
Summary and Recommendations .....	102
REFERENCES .....	104
APPENDIX A 1996-97 <i>SETS</i> Instrument .....	118
APPENDIX B 1997-98 <i>SETS</i> Instrument .....	122
APPENDIX C 1997-98 <i>DERST</i> Instrument .....	126
APPENDIX D House Bill 1911 .....	131
APPENDIX E Louisiana State Technology Plan Objectives .....	139
VITA .....	146

## LIST OF TABLES

Table 1.1.	U.S. Technology Spending .....	1
Table 1.2.	Examples of District CBTF Funding, 1997-98 .....	11
Table 2.1.	Typology of 1980s School Reform Efforts .....	24
Table 2.2.	National STaR Assessment For Technology and Use .....	35
Table 2.3.	STaR Characteristics of Low Technology Schools .....	35
Table 2.4.	STaR Characteristics of Maximized Technology Schools .....	36
Table 3.1.	Part One Likert Scaling for 1996-97 Responses ( <i>DERST</i> ) .....	47
Table 3.2.	Part One Likert Scaling for 1996-97 Responses ( <i>DERST</i> ) .....	47
Table 3.3.	Part Two Likert Scaling ( <i>DERST</i> ) .....	48
Table 3.4.	Case Study District Selection Categories .....	51
Table 4.1.	Sample Response Rates .....	54
Table 4.2.	Student/Computer Ratios .....	56
Table 4.3.	School Internet Connectivity Levels .....	56
Table 4.4.	Peripheral Technology Levels .....	56
Table 4.5.	Part One <i>DERST</i> Scale for 1996-97 .....	57
Table 4.6.	Part One <i>DERST</i> Scale for 1997-98 .....	58
Table 4.7.	Paired-Samples T-Test for Part One ( <i>DERST</i> ) .....	58
Table 4.8.	Policy Measure with a Mean Response Below 3.0 .....	61
Table 4.9.	Top Ten Policy Measure Ranked by Mean Response .....	62
Table 4.10.	Ranking for the Top Five Policy Measures .....	63

Table 4.11.	Mean Responses for Questions #19 & 20 .....	64
Table 4.12.	Response Frequency for #19 .....	64
Table 4.13.	Response Frequency for #20 .....	65
Table 4.14.	Mean Responses for #30 & 31 .....	65
Table 5.1.	Lorraine Parish Technology Training .....	79

## ABSTRACT

During the 1990's educational technology became a major educational policy issue for every state (White, 1997; Education Commission of the States, 1997; National Council of State Legislators, 1996; Trotter, 1997). By early 1998, all 50 states had state-level technology plans in various stages of implementation, and state funding for educational technologies was rapidly increasing across the country (Trotter, 1997). The purpose of this study was to examine the impact of recently enacted Louisiana state-level technology reforms on public school district technology efforts between the 1996-97 and 1997-98 school years. Both quantitative and qualitative methods were used to collect data, creating a mixed methodological strategy.

The quantitative data for this study came from three separate survey instruments. The 1997 and 1998 Louisiana Educational State Technology Surveys (*SETS*) were designed to annually gather district and school technology level data for the state. The third survey instrument, A District Evaluation of Recently Enacted State Educational Technology Policies (*DERST*), was specifically designed to gather district perceptions of the state's technology reforms that were implemented during the 1997-98 school year. Qualitative data were gathered through case studies of three Louisiana public school districts.

Descriptive statistics were utilized to initially analyze the data from all three surveys. *Analysis of Variance (ANOVA)* was used to determine if there was

any significant difference between district responses to questions in the *DERST* instrument when districts were placed in the following sets of sub-groups:

- district type - rural, suburban and urban districts;
- district size - small, medium, and large districts;
- district technology levels - average, below average, above average.

Cross-case analysis (Herriot and Firestone, 1983; Yin, 1990) was utilized to develop and analyze data from case studies on three public school districts.

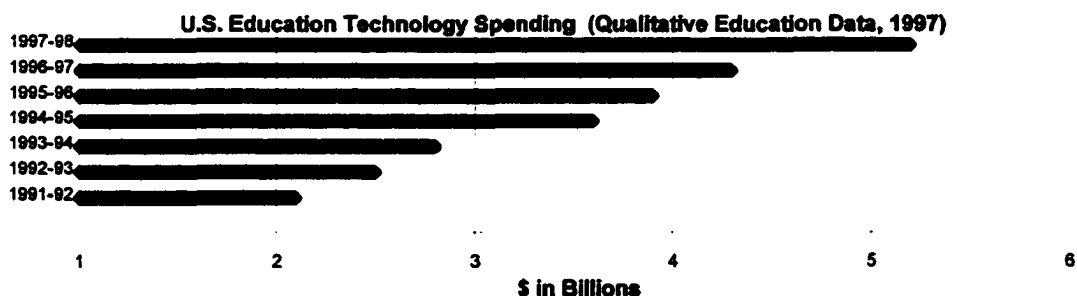
Content analysis was then utilized to analyze case study data and determine emerging themes and patterns (Patton, 1990; Yin, 1984; Miles, 1990). The data were reported in the form of case studies and provided insight into the impact of state technology reforms on district technology efforts during the 1997-98 school year.



## CHAPTER ONE INTRODUCTION

Educational technology has become one of the major education reform issues of the 1990's. Billions of dollars (\$5.2 billion in 1997 alone) have been invested at all levels of government in order to provide American schools with enhanced educational technologies (e.g. computers, software, local and wide area networks, internet connections, compressed video, and associated training).

Table 1.1 U.S. Educational Technology Spending, 1991-1998



During the 1980's, while the majority of educational reforms focused on state driven top-down mandates, the push for educational technologies was mainly a bottom-up reform, initiated and driven by interested teachers and students rather than state policy makers (Starr, 1996). During the 1990's however, educational technology has become a major educational policy issue for every state (White, 1997; Education Commission of the States, 1997; National Council of State Legislators, 1996; Trotter, 1997). By early 1998, all 50 states had state-level

technology plans in various stages of implementation, and state funding for educational technologies was rapidly increasing across the country (Trotter, 1997).

Much of this state funding for educational technology is awarded to local education agencies (LEAs) by state governments through what McDonnell and Elmore (1991) define as “capacity-building” mechanisms. This means that funds are provided to individuals or agencies in the hope of future returns. The federal government’s Goals 2000 funding is a prime example of a capacity-building mechanism. Federal dollars have gone out to states and LEAs with the requirement that they follow some very broad guidelines or policies regarding the use of such funds. In return, Congress expects improved student learning as a return on this investment.

Yet research shows that these future returns are not dependent solely on how well state policies (i.e., state guidelines, laws, activities, and funding) are designed, the amount of state funding allocated, or even the level of local compliance. Any guidelines or policies designed to achieve substantial change in education at the school level must first penetrate the district level, and such policies may be adapted differently depending on how each district perceives and then implements the policies (McLaughlin, 1991; Cohen, 1982; Furhmann and Elmore, 1990; Lindquist and Mauriel, 1989). Consequently, once implemented,

state policy can take on as many variations as there are local districts and/or schools. This has made the effective implementation of state policies across district boundaries a complicated issue that Clune (1987) and McLaughlin (1991) argue has frustrated policy makers, educators, and researchers alike.

While numerous studies of various technology reform efforts abound in the literature, no known studies which examine the impact of recently implemented state-wide technology reform on local districts currently exist in the literature.<sup>1</sup> This conclusion came after an exhaustive search of periodicals, books, Dissertations Abstracts International, and communications with the two education policy laboratories: Education Commission of the States (ECS), and the Southern Regional Education Board (SREB).

### Purpose

The dissertation sought to examine the impact of state technology reform on local district technology initiatives. Reform occurs when existing policy (i.e., laws, guidelines, activities, funding) is changed or new policy is created. The focus of this dissertation was the first year impact of Louisiana's state level educational technology reform on public school district technology initiatives. This was accomplished by examining the district perceptions of the state policies

---

1

The Education Commission of the States explained that the lack of evaluation studies may be due to the fact that very few states had completed implementation of their state technology reforms, largely due to funding considerations.

created to support educational technology, as well as examining the district educational technology levels (student/computer ratio, the number of computers, the number of internet connections, etc.) during the year before (1996-97) and the year after (1997-98) these new technology policies were implemented.

### Background

Louisiana has historically ranked at or near the bottom in almost every education category -- nationally and regionally. The area of educational technology has not been an exception. In a 1996 poll comparing the ratio of computers to students in all U.S. public schools, Louisiana ranked 51<sup>st</sup>, providing only one (1) multimedia computer for every 89 students. Even Louisiana's student to *all* computer ratio left Louisiana dead last among the 15 Southern Regional Education Board (SREB) states (Southern Regional Education Board, 1996).

### Louisiana's Current Reform Policies

During the 1980's educational technology efforts in Louisiana were largely a local district/school endeavor as they were across the country. The state had passed legislation in 1991 (Louisiana Revised Statutes, 17: 3921) which created the Office of Instructional Technology within the State Department of Education. However, this office only received funding to operate for one year. In the absence of state dedicated tax dollars for educational technology, many school districts

found financial support for their local technology initiatives through a variety of sources: e.g., state funded 8(g) grants, corporate and local donations, business/corporate technology partnerships, re-allocated local funding.

The State Board of Elementary and Secondary Education is constitutionally mandated to allocate earnings from the Louisiana Quality Education Support Fund, commonly referred to as 8(g) funds. Since the creation of 8(g) funds, \$324 million dollars have funded over 4,400 projects (Report to the Committee on Education, 1998). These funds have been annually awarded to districts and schools through three separate funding mechanisms.

- Competitive Grants - competitive awards for exemplary programs designed to improve student achievement;
- Block Grants - allocated on student enrollment figures;
- Statewide Programs - limited to state agencies but must provide equal access to all school systems.

Approximately \$92 million of the 8(g) funds awarded since the 1992-93 Fiscal year have been used for technology efforts (technology purchasing and training) across the state (Urbatsch, 1998). During the 1997-98 fiscal year, ninety elementary and secondary educational technology projects received 8(g) grant block funds.

In 1995, through the efforts of the Louisiana State Department of Education and the Louisiana Systemic Initiatives Program (LaSIP), a \$4.3 million Federal Challenge grant was awarded to LaSIP and five Louisiana schools districts (Calcasieu, Lafayette, Jefferson, Natchitoches, and Monroe City). This program was named Louisiana Challenge. Spread out over a five year period, these Challenge grant funds were used to create technology enriched pilot sites within these five school districts. These pilot sites were established so that models for the development of technology integration, communications networking, and technology training and professional development would be available to serve districts and schools across the state.

Louisiana school districts also received approximately \$22 million dollars in Goals 2000 dollars from the federal government between 1994 and 1997 (Louisiana State Department of Education, 1997). The majority of this federal money was used by LEAs to plan and implement district/school improvement plans, and many of these improvement plans possessed a district/school technology component. By the time the state technology plan was endorsed in December of 1996, 1,032 (73%) of the state's 1,432 public K-12 schools reported that they already had a technology plan attached to their school improvement plan (*Louisiana State Technology Report*, 1996-97). Although these district plans served as role models in the design of the state technology plan, these efforts were

somewhat fragmented because they lacked guidance by any formal policies and funding.

### Development of the State's First Technology Plan

LaSIP began work on a state technology plan in the mid-nineties with minimal success. It was not until the Louisiana LEARN Commission called for the establishment of a state technology plan as part of a larger state educational reform plan, that the technology plan found the support and guidance from agencies and people across the state. Through the cooperative efforts of the Louisiana LEARN Commission, the Board of Elementary and Secondary Education (BESE), the Louisiana Systemic Initiative Program (LaSIP), Louisiana Public Broadcasting (LPB), the Louisiana Network Infrastructure for Education, and the State Technology Advisory Committee (LaNIE), a draft of the state technology plan was presented to the public in September of 1996. Regional meetings were then held around the state so that education, business, and community leaders could discuss the draft and provide feedback. By December of 1996, the final draft of the plan was adopted by the Board of Elementary and Secondary Education and endorsed by state leaders.

### The State Educational Technology Plan

The single goal of the *Louisiana State Plan for Educational Technology* is that “All educators and learners will have access to technologies that are effective

in improving student achievement” (p. 2). This goal is built on five core beliefs stated in the plan:

- A person’s ability to select, use, and apply technology appropriately is increasingly as basic to economic and social prosperity as are reading, writing, and arithmetic.
- Every Louisiana learner should have opportunities to acquire the technological knowledge and skills necessary to compete in a global economy and to exercise the rights and responsibilities of citizenship.
- The appropriate integration of technology with standards-based curricula and instructional management enhances student learning.
- All stakeholders share the responsibility to develop and implement standards-based technology programs in Louisiana schools.
- Louisiana supports the concept of “universal service,” as expressed in the Federal Telecommunications Act of 1996, which requires that all schools and libraries have access to basic telecommunications.

The plan also develops six objectives with recommended strategies and key tasks designed to help the state, its districts, and their schools achieve the primary technology goal over a five-year time line (Appendix E). Information regarding



the key tasks, players, and the proposed time-line for completion can be found in the state plan for educational technology.

### State Legislation and Guidelines

Following on the heels of the completion of the state plan, the Louisiana Legislature made its first financial commitment to support state-wide educational technology during the 1997 Regular Legislative Session. During that session it appropriated \$37.2 million dollars to the newly created Classroom-Based Technology Fund (CBTF) for distribution to all public school systems and approved non-public schools. House Bill 1911, which created the Classroom-Based Technology Fund, also created several critical pieces of the state's educational technology policies.

Section C of House Bill 1911 created the "State Technology Advisory Committee ." This committee was assigned the task of making recommendations to the State Board of Elementary and Secondary Education regarding appropriate procedures and guidelines for awarding technology grant dollars from the Classroom-Based Technology Fund. The bill stipulated that these grant funds be allocated using a student population (based on the most current student population numbers) formula developed by the State Department of Education

The bill required that applicants submit a technology grant application that was approved by the State Board of Elementary and Secondary Education. The

grant application had to include a district technology plan which was clearly linked to improved student learning. Each school that would receive state Classroom-Based Technology Funds was also required to have a technology plan.

Applications had to also explain or demonstrate how grantees would:

- target the funds to improve student learning;
- measure student learning with measurable evaluation;
- train their teachers to use this new technology;
- maintain this equipment;
- coordinate federal, state, and local monies to fund their plan;
- demonstrate and confirm that academic software purchased with grant funds is consistent with academic standards adopted by the State Board of Elementary and Secondary Education;
- demonstrate and confirm that appropriate policies regarding classroom internet use are in place;
- demonstrate and confirm that hardware and software shall only be placed in educational settings with individuals who are properly trained or are receiving training.

The bill also stipulated that Classroom-Based Technology funds can only be used for one-time nonrecurring expenses that fall into one of the following categories: hardware (e.g., computers, servers, printers, modems), software (it

must target classroom curriculum and instruction, and address high academic standards), wiring, and service to install such items. Approximately \$4.3 million dollars were also made available to districts and schools for technology centered professional development and training through the Federal Technology Literacy Challenge Fund.

#### Initial State Funding of State Educational Technology

During the 1997-98 school year, the \$37.2 million was awarded through Classroom-Based Technology Fund grants to 66 state public school districts, 6 independent schools (special schools and laboratory schools), 7 diocesan systems, and 59 independent approved nonpublic schools. Administered by the newly created Louisiana Center for Educational Technology (LCET), Classroom-Based Technology Fund grant award amounts were calculated using a per-pupil funding formula as stipulated in House Bill 1911. Based on the recommendation of the State Board of Elementary and Secondary Education, districts dedicated six percent of their grant funding to support regional educational technology activities.

**Table 1.2 Examples of District Funding from the 1997-98 CBTF**

<b>District</b>	<b>Student Count</b>	<b>Student Count Funding Amount</b>	<b>6% To Regional Activities</b>	<b>Remaining LEA Funding</b>
Acadia	10,741	\$436,085	\$26,565	\$409,520
E. Baton Rouge	56,752	\$2,304,131	\$140,359	\$2,163,772
Red River	2,058	\$83,555	\$5,090	\$78,465

### **The Grant Application Process**

Districts and schools were required to complete a state approved grant application, and submit the completed application to the LCET for review during one of five grant review cycles scheduled throughout the 1997-98 school year. Grant applicants were required to address the following eight issues adapted from House Bill 1911 in their district technology plan:

1. A summary of the stakeholders involved in the plan and their projected contributions to its implementation;
2. A needs assessment which indicates the current status of technology, including the status of wiring schools;
3. District and school goals and objectives for the use of technology;
4. A summary of how current monies available to the district are being used to promote educational technology;
5. The specific technologies requested for purchase (computers, software, calculators, CD-ROMS, etc.);
6. An explanation of how the requested technologies (a) will be integrated with instruction, and (b) will facilitate instructional administration and management;
7. A summary of strategies to provide continuing technical assistance and professional development; and
8. An overall plan of evaluation with the focus on student achievement.

### **Review of Grant Applications**

After a district or school submitted a grant application, there were three stages of review before funds were allocated. Stage one involved a review of the grant application by an appointed team from the Louisiana Department of Education. Their task was to ensure that the grant application met state and federal grant criteria and standards. After this initial review, grant applications received one of three possible ratings from a review team: “Full Approval”, “Approval Contingent Upon Modifications”, or “In Need of Further Development”.

In stage two, the State Department of Education and the State Technology Advisory Committee jointly reviewed the applications recommended by Stage One Review Teams. The State Technology Advisory Committee examined the recommendations, and identified those grant applications that should be submitted to the State Board of Elementary and Secondary Education for “Full Approval” or “Approval Contingent Upon Modifications”. In stage three, the State Board of Elementary and Secondary Education’s job to review the recommendations and make the final decision regarding the allocation of funds to those applicants who have received “Final Approval”.

Districts and schools who received “Approval Contingent Upon Modifications” were required to make modifications to their grant application that would satisfy the Department of Education before funds could be allocated.

Those applicants who received a rating of “In Need of Further Development” received technical assistance from the Department of Education and were encouraged to resubmit their application.

### Summary

There are four major policy measures that compromise the heart of the state’s recent educational technology reforms. Two of these are part of the Classroom-Based Technology Fund. The first was the actual grant process. The second was the requirement that every district and school receiving these grant funds have a technology plan in place that meets with the state’s broad-based guidelines. The third was state funding of local technology efforts through the Classroom-Based Technology Fund. The fourth was the creation of the Louisiana Center for Educational Technology (LCET), which provides statewide support (information dissemination) and technical expertise through workshops and training.

### Research Questions

This dissertation analyzed the impact of recently enacted state technology reforms on district/school level technology efforts by answering the following question:

1. How did district technology levels (the self-reported numbers of computers, printers, networks, funding, etc.) differ when comparing the 1996-97 school year and the 1997-98 school year – the year before and after implementation of state’s new technology policies?

2. To what degree did specific technology-related policies/measures exist at the district level during the 1996-97 school year? The 1997-98 school year?

(a) Was there significant change between the 1996-97 and 1997-98 school years?

3. What were the district perceptions of various state technology policies implemented in the 1997-98 school year?

(a) Was there a significant difference in district perceptions of state technology policies in relation to district size (small, medium, or large), district type (rural, suburban, or urban), or district technology levels (average, above average, below average)?

4. How were districts affected by the implementation of the state's new technology policies in the 1997-98 school year?

(a) How did districts spend their state technology funds?

(b) How did state technology policy affect their district technology plan?

(c) How did state technology policy affect school technology plans?

### Significance of the Study

The 1980s and 1990s produced a tremendous amount of research on educational technology. This research has focused on technology and technology related specifics, such as hardware/software installation and usage, networks, distance learning, classroom use, and professional development.

All 50 states now have a technology plan that is at some stage of implementation, but no state, agency, or individual has yet conducted any study examining the impact of these state educational technology reforms on district technology initiatives. So, research that examines the impact of state educational technology policy on local districts is timely. Moreover, examining the impact of state technology reforms on local technology efforts will add to the literature on technology implementation, while also providing feedback to state policy makers.



## CHAPTER 2

### REVIEW OF THE LITERATURE

This chapter will discuss the relevant literature in three subsections. The first briefly examines education reform and restructuring efforts since 1982. The second subsection focuses on the education policy implementation literature during the these three reform periods, and the third focuses on the specific body of literature examining the implementation of education technologies. Since education policy implementation literature and educational technology literature fall under the broader context of education reform literature examining all three gives a clearer view of the complexities involved in creating effective education technology policy.

#### A Brief History of Education Reform

In 1982, the National Commission on Excellence in Education issued a small but highly influential report on American education that is most identified by analysts (Murphy, 1990; Kirst, 1990; Boyer, 1990; Warren, 1990; Lunenburg, 1992) as the compelling catalyst for the “the most sustained and far-reaching [education] reform effort in modern times (Boyd, 1990, p. 42). Created by the National Commission on Excellence in Education, the report warned that the

educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people. . . . If an unfriendly foreign power had attempted to impose on America the mediocre performance that exists today, we might well have viewed it as an act of war. (p. I)

The report's powerful rhetoric tied education directly to the American economy and American jobs. Unless rapid and radical change was made to rectify the educational crisis, the report warned that America would fall victim to the increasing economic "threat" from the Pacific Rim because our children would not be prepared to live and work in an increasingly competitive global market place where new technologies demanded highly educated employees. In other words the U.S. was losing its edge in the economic pecking order. Much like the launch of Sputnik more than twenty years before, the media, the public, and most importantly state leaders eagerly supported the plan's call to action. *A Nation at Risk* (1982) made five recommendations to improve American education:

- increase state and local high school graduation requirements;
- create higher expectations for academic performance and student conduct and more rigorous and measurable standards;
- increase the time devoted to learning; more effective use of the existing school day, a longer school day, or a lengthening the school year;
- create higher salaries and educational standards for teachers; eleven month teacher contracts;
- develop greater leadership at the school level; federal collection of education data; maximize federal assistance while minimizing

federal intrusion and burden; federal identification of national education interests and support for those interests.

### The First Wave of Reform

Following the report's recommendations, state governments reacted quickly through the mid-eighties by initiating top-down reforms in what is now referred to as the "first wave" of reform (approximately 1982-1986). In the mid-1980s, 275 education task forces were created (Chance, 1988), and 700 state laws pertaining to school reform were passed (Timar & Kirp, 1989; Darling-Hammond & Berry, 1988). These new mandates created higher graduation rates for 43 states, higher college admission standards for 17 states, new teacher certification standards in 28 states, and student assessment programs in 37 states (Chance, 1988). At the same time state funding of education increased too. Across the country the average share of state spending on education was approximately 40% in 1970; by 1985 that share had grown to 50% (Center for Education Statistics, 1997). Boyd (1990) points out that flurry of state education reforms that were initiated after *A Nation At Risk*, were due, in part, to the strong connection state governors would make between reforming education at the state level and improvement of state economies. By 1986, many of these top-down reform efforts seemed to be stalled (Fuhrman, Firestone, and Kirst, 1989). Consequently, they came under increasing scrutiny by those (Boyd, 1987; McLaughlin, 1991; & Wohlstetter, 1995) who believed that change must begin at the school level asSizer (1984), Boyer (1983), and Goodlad (1984) were arguing.

In *Horace's Compromise* (1984), a three year study of American high schools, TheodoreSizer found that American high schools had evolved little since the nineteenth century. Students were still treated as passive vessels wherein knowledge was deposited by specific teachers who taught specific isolated subjects during specific hours of the day: "Most high school students have several teachers who know a bit about them, but no teacher who sees them whole . Unless they are in some limited enclave . . . they are anonymous" (p. 208-209).

Orlick (1989) regards John Goodlad's *A Place Called Schools* as the "most comprehensive report on school reform of the 1980s" (p. 513). In the report, Goodlad examined 38, K-12 schools in seven states. Goodlad found that education in American schools was in many ways one dimensional. Teachers rarely varied their teaching methods and styles. Students seemed apathetic, and why not? Most teachers, with the exception of some elementary school teachers, taught to large groups, provided little student feedback (positive or negative), and made little use of alternative teaching methods and materials. Goodlad arrives at the conclusion that the earlier educational reform efforts had done little to change the most important location in education -- the classroom.

In *High School* (1983), Ernest Boyer concludes that while focusing on the improvement of American education is the right challenge, reformers have chosen the wrong responses. Completing another required course does not guarantee that students will be more responsible citizens or even less ignorant. Like Goodlad

andSizer, Boyer believes that high schools lack the vision needed to provide students with a quality education.

Boyer called for an urgent comprehensive plan to improve American high school education. Boyer's plan consisted of twelve priorities. First, effective schools must have a clear mission with clearly state goals, and educators who share the same vision. Second, learning oral and written language skills are the key to any education and must be heavily emphasized. Third, there must be some common core curriculum that contains the study of Literature, American History, Western Civilization, Science, Technology, Math, Foreign Language, Arts, Health, Civics, and Work. Fourth, high school should help all students make the transition from school to work or college. Fifth, students should be required to meet a volunteer service requirement. Sixth, working conditions for teachers must be improved. Seventh, teacher/student instruction time needs to change so that teachers use a variety of teaching styles. Classrooms instruction needs high expectations with fair evaluation, and teachers should have more voice in selecting materials. Eighth, technology should be used to enrich instruction and learning, but careful planning for purchasing, implementation, usage, and professional development is essential for success. Ninth, flexibility in scheduling, course offerings, programs for special populations (e.g., gifted and talented students , as well as those students who need remedial help or who special education needs), and programs for returning dropouts. Tenth, the principal and

the school staff should have more control over their local school decision-making.

Eleventh, school connections between elementary, middle, secondary, and post-secondary level institutions must be improved. Lastly, public commitment is critical for school improvement. This means that parents active partners in the process. Community coalitions should be established. States need to establish general standards and provide fiscal support, but they should cease micro-managing local education.

### The Second Wave Of Reform

In 1986, three new national education reports were published: *A Nation Prepared: Teachers for the 21<sup>st</sup> Century*, *Tomorrow's Teachers*, and *a Time for Results: The Governor's Report on Education*. These reports mark the beginning of the "second wave" of reform, which took a more grass roots, bottom-up approach to education reform as opposed to the earlier top-down reforms of the first wave. All three reports argued that successful reform would require more coordinated efforts among the varying groups and players. They also agreed that "first wave" reforms possessed a common flaw that was partly to blame for their failure -- the exclusion of teachers.

In *A Nation Prepared: Teachers for the 21<sup>st</sup> Century*, the Carnegie Forum on Education and the Economy called for reform efforts that focused on teachers and teaching. Education needed to be restructured to include better salary scales for teachers (\$72,000 maximum), the establishment of a national board for teacher

licensing, greater teacher decision-making and professional development, increased flexibility in the existing school day, and more professional atmosphere for teachers that includes more resources (e.g. staff, time, and technologies) that increase teacher productivity.

In *Tomorrow's Teachers*, the Holmes Group (a national group comprised of university/college deans) also called for the professionalism of teaching, and the involvement of teachers in decision making at the local level. They also called for a national test for teachers, the creation of a national network of cooperating universities, the restructuring of teacher education programs to include a six-year teacher preparation program that would cost prospective teachers and other \$15,000 in tuition. Orlich (1989) criticized the Holmes Group for their “naive amateurism” that provided beautiful cliches with little or no practical base.

One of the after effects of these three reports was that the National Governors Association created “Project Education Reform”. The program had five year agenda that called for states to raise teacher salaries, increase school technology use, promote school choice experimentation, and prepare at-risk, pre-K children for school.

Second wave reforms also focused more on school culture (Lieberman & Miller, 1984; Little, 1986; Darling-Hammond, 1987). Researchers began constructing a knowledge base about school culture and the relationships at work within that culture, while reforms efforts focused on changing schools into places

where principals and teachers worked as teams. Decentralization of bureaucratic power, created reform efforts like site-based management (SBM) that gave a wider range of stakeholders the chance to be involved in decision making at their schools (Hannaway, 1993; Odden, 1991; Wohlstetter, & Odden, 1995). As a result of decentralization, many states moved away from micro-managing schools and began serving in more of a support role -- providing resources, training, and professional expertise that supported and enhanced local education efforts.

David Plank (1987), divides the reform efforts of the 1980s into four categories to show how many of these reforms were focused on surface level changes rather than truly structural changes – reforms rather than restructuring (Table 2.1).

**Table 2.1 Typology of 1980s School Reform Efforts**

<b>Additive</b>	<b>External</b>	<b>Regulatory</b>	<b>Structural</b>
New Revenues Increased salaries Pre-school initiatives mandatory kindergarten Computer Literacy	Pre-service teacher tests Certification changes School Standards Exit Tests Graduation requirements	Longer school day Longer school year More basic skills statewide assessment	tax credits vouchers Career ladders Smaller classes Inservice teacher tests

### **The Third Wave of Reform**

The third wave of reform began with the creation of the National Educational Goals in 1990, which came out of the highly successful 1989 meeting between President Bush and state Governors in Charlottesville (Lunenburg, 1992). Labeled the “systemic” reform movement or restructuring movement,



third-wave reforms efforts were more ambitious. Rather than change parts of the existing system as the earlier reforms had, third-wave reforms sought to combine bottom-up and top-down reform efforts at the federal, state, and local levels in an effort to change multiple parts of the system simultaneously (Murphy, 1990).

Unlike the earlier two waves, this third wave has involved greater cooperation between the districts, states and the federal government on matters of education policy (Cohen, 1995), that in turn helped create new policy to support change (Goals 2000 and Title 1 are just two examples of these new cooperative efforts at the federal level). An integral part of systemic reform has been federal and state attempts to reduce existing laws and policy that stood in the way of local flexibility and reform (Smith and O'Day, 1993).

While states began providing local districts with greater autonomy, states also began calling for higher academic standards and greater district and school accountability. Odden (1991) argues that all of these systemic reform efforts seek one end -- "to design and implement in schools and classrooms education programs that substantially improve student performance" (p. 299). Wohlstetter, Smyer, & Mohrman (1994) found that later studies showed that organizational performance improved significantly when decision-making powers were moved to local levels, provided that personnel at the local level was provided with professional development that develops decision-making strategies.

In 1991, Larry Cuban published a seminal article on education reform in *Educational Researcher*. In it, he argued that reforms come and go and return

again, but these reforms make little difference in the bigger educational picture.

Simply put in times of social turmoil, Cuban argues that Americans have always turned to education as a “panacea for all the ills of the body politic . . .” (P. 8):

When economic instability, shifts in population, and social change uncover tensions, individual champions of particular values and coalitions of interest groups surface. Media and other groups translate the unrest into recommended policies for school to enact.

Most the reforms however fail to get passed the classroom door Cuban argues because these reforms are not seen as valuable by administrators and teachers.

Cuban (1992) identifies why some reforms fail and other are institutionalized, by placing education reforms in to two broad categories:

- incremental reforms - designed to improve existing structures;
- fundamental reforms - designed to transform or alter permanently.

Looking at reform through the historical lense, Cuban determines that scholars (Tyack et al., 1980; Kirst and Meister, 1985) have identified three basic factors that account for the institutionalization of some education reforms in American history. First, successful reforms enhance the existing education structure rather than disturb it. For example, Cuban points to the addition of staff (e.g., teachers for special education and vocational education, counselors for guidance) and space for social services as an example of reforms that enhanced existing school programs. Second, successful reforms were visible to stakeholders and easy to monitor. Health clinics, summer school programs, extended day, additional classes either existed or did not. Third, these reforms “created constituencies

[across the community] that lobbied for continuing support” (p. 171) because these reforms enhanced the existing school and were visible to the various stakeholders who had a vested interest in their survival. Cuban also argues that these reforms endured because they allowed the institutions to “adapt their formal and informal goals, structures, and processes to an uncertain, ever-changing environment on which they depend for survival” (p.172).

### Implementing Reforms

Reform efforts have never found the road to successful education change an easy one. As Fullan and Miles (1992) point out “education is a complex system, and its reform is even more complex” (p. 746). Significant change requires that new policies must penetrate districts, schools, and classrooms (McLaughlin, 1990) and become an everyday school behavior, a process that Sergiovanni (1987) labels “institutionalization.” Odden (1991) argues that “significant change in classroom practice is needed in order to claim that full implementation has occurred” (p.305). This process of does not occur in weeks or months. In most cases it requires a multi-year commitment on the part of the teaching staff and the administration. Their commitment, in turn, requires the long term commitment of resources and support from central office, the community, and state policy makers (Louis and Miles, 1990). This is why many innovations are implemented but rarely institutionalized (Miles, 1983).

Reform research in the 1970s and 1980s argued that many times the reason local players failed to implement state reform policies at the district and school

level was “lazy noncompliance” or even resistance. In fact, later research by Fuhrman et.al (1991), shows that many districts are actually pro-active rather than reactive as the earlier research had suggested. They found, contrary to earlier warnings, the proliferation of state reforms and policies were not the death knoll of local control. In fact, many districts actually respond positively to state reforms. For example, in 43 states where created new state level policies regarding high school graduation requirements were mandated, many districts (75% of the districts in Pennsylvania) met and surpassed state requirements with their own new graduation requirements before the state policy was even implemented. In over half of the districts studied, local districts took advantage of new state policies and the funds that generally accompanied them to support local priorities. In some cases, local leaders even used state policy as a lever to move their own local initiatives forward, so much so that local district initiatives actually influenced state policy decisions.

Fuhrman et. al also discovered that certain factors were not as critical to successful policy implementation as earlier research had suggested. While successful implementation is dependent on support from both policy makers and educators, the support of local stakeholders is not dependent on their participation in a policy’s initial design. Policy clarity was also as critical an issue for successful local compliance and implementation as previously thought. Local school personnel were found to be quite capable at interpreting and understanding often ambiguous state policy.

On the other hand, district context turned out to be much more important and complex than earlier research had suggested. When it came to policy making and reform, districts were far more pro-active and influential than previously thought. District level personnel were even actively influencing and responding to state policy:

many of the districts we observed busily making their own policies, engaging in networks with and borrowing from other local districts. Such districts do not merely adapt to state policy, they orchestrate and amplify policies around local priorities, whether or not any of the other conditions that would make those policies easy to implement exist. . . . District context appears not only important but paramount (Fuhrman et. al in Odden, 1990, p. 217).

Their research supports the research of Elmore (1993) and McLaughlin (1991) that district perception and context plays an crucial role in the implementation of state policies.

Building on the work of Stigler (1971), McKean (1980), Gramlich (1977) and Barro (1978), McDonnell and Elmore (1990) identify and define four basic policy instruments (two derived from previous economics literature) which act as mechanisms for making policy goals reality.

Mandates are the rules states create to govern the actions of individuals and agencies. No money is exchanged for compliance. Instead, compliance is enforced through coercion. The mandate's required action is expected of all individuals or agencies, no matter differences might exist between them.

Inducements, on the other had, require transfers of money in exchange for goods and services that agencies or individuals produce (Bardach, 1980 in

McDonnell and Elmore, 1990). Inducements are a means to produce or enhance performance. Capacity-building is an investment in the future, giving money to individuals or agencies in the hope of future returns. Goals 2000 funding is good example of a federally funded capacity-building mechanism.

Between implementation and institutionalization, reforms fail for several reasons. McLaughlin, (1991) argues that specific state policies often fall short of the anticipated outcomes due to the variation of implementation across districts and school sites. Moreover, policies can fail or succeed depending a local district or school's judgement regarding a policy's worth or applicability to their specific site. Adding to the complexity of implementation success is the research by Fuhrman, Clune, and Elmore (1991), which strongly suggests that the success of any state policy at the local level depends on the existence of a relevant local knowledge base and local personnel who have the training necessary to make the necessary changes.

Clark & Astuto (1994) assert that local school improvement requires the cooperative efforts of the community, parents, central office, administrators, teachers, and students working together throughout the development, planning, and implementation of any plan. These groups do not have to agree unanimously, but they must reach some consensus regarding their plan and its intentions for their school (Darling-Hammond, 1993).

Research by Shelton (1993) and Pope (1994) and Wohlstetter, (1995) argues that teachers are one of the most crucial links in the local decision making

chain, so they should be included in all aspects of local planning and decision making. Even when teachers are included, they often feel out of place because they believe they lack the professional training and knowledge base to make the big decisions (Taylor & Bogotch, 1994). David (1994) also cited a lack of expertise as a major reason that site-based management teams often intentionally avoided making decisions that affect curriculum and instruction.

Crandall's (1983) study of innovative practices in 146 school districts discovered that implementation was significantly more successful when district strategies encouraged teacher commitment to innovations. Once they were committed, teachers were more likely to act as change agents in support of innovations and district policy because they felt like the innovation was somehow connected to their own teaching beliefs and goals.

### Implementing Technology

Until teachers have a clear vision about technology as it relates to their teaching and student learning, Means, Olson, Blando, & Middleton (1993) argue that teachers will lack the incentive needed to devote the necessary time and energy needed for meaningful technology usage. Calfee (1991) argues that more than teacher commitment is necessary; the whole school must work together to create an environment where technology and learning combine to promote learning strategies that challenge students. States, districts, and schools should avoid a "one size fits all" approach to technology planning and instead encourage

teachers to develop unique plans that complement their students, classrooms, and curricula (Hawkins, 1994).

Cuban (1986) argues that technological innovations have historically failed in schools because they failed to mesh with the culture of the classroom and serve teachers' perceived needs within that culture. Beyond teachers' perceptions of the classroom, Kinnaman (1995) adds that another larger obstacle to technology reform is our idea of school "because it brings to mind a particular image based" on the school experiences of parents, teachers, administrators, and policy makers (p. 62). He goes on to argue that until [America] deconstructs that image and constructs a new image of schools, teaching, and learning, technological innovations such as multimedia computers cannot be fully realized because "modern technology is not a good fit for school as we know it" (p. 62). Giroux's (1985) argument that change efforts are further complicated by the association of reform efforts with the indirect devaluing of teachers is accentuated further by the historical desire to make technology a form of "teacher proof instruction" (*Technology and education reform report*, 1995). Successful technology initiatives will need to help all stakeholders rethink these complex perceptions before successful change can go forward. This process begins by creating a strong staff instructional goal that uses technology to enhance and evaluate student learning. At the same time, long term curricular goals and evaluation should be developed as a part of the larger initiative that focuses on what teachers



need to teach and students need to learn. Without these two components, technology will most likely just serve to reinforce the status quo (Cuban, 1986; Cohen, 1988). Stager (1995) points out that moving from a “traditional” school environment to a technology rich environment is an arduous process that requires a three to six year commitment (Hadley and Sheingold, 1993; Jordan and Follman, 1993; Siegel, 1995; OTA, 1995).

In their study of 76 teachers, Wiske et al. (1988) found that teachers almost unanimously agreed that the addition of computers into their classrooms made their jobs more difficult at first for several reasons. Incorporating computers into the daily routine required greater planning that had also required that teachers deal with the logistics of getting students on a limited number of machines. To make matters worse, school level technical assistance was almost non-existent. Consequently, teachers also found themselves dealing hardware and software problems that occur all too frequently during technology implementation.

The Wirthlin Group’s 1989 national survey of teachers found that 59% of 12<sup>th</sup> grade teachers believed that “most teachers using computers for instruction are inadequately trained” and that their own students were more computer literate than they were (Wirthlin, 1989). Thirty-one percent of these same teachers polled also felt that computers were not being used effectively in American education. Seven years and billions of dollars later, only 13.4% of teachers polled in a 1996 survey believed that computers with internet access helped students achieve better

results. Siegel (1995) found that teachers expressed little satisfaction with current technology development for several reasons: lack of time provided for training, collaboration, and experimentation.

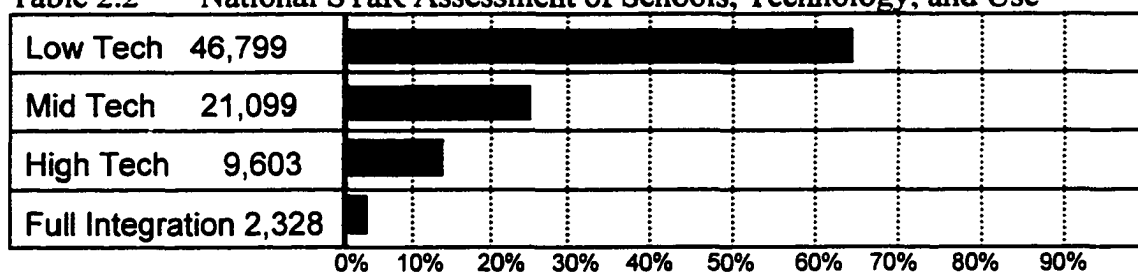
In *Teachers and Technology: Making the Connection*, the Office of Technology Assessment (OTA, 1995) found that professional technology training for teachers usually focused on the mechanics of operating computers rather than discussing technology's relevance to what happens in the classroom or its possibilities to enhance teaching and learning (1995). The same OTA report also stated that current pre-service training offered little that would help future teachers integrate technology and teaching.

In 1996, the Rand Corporation published a national study of educational technology efforts. They found that school wide technology use was still "rare and isolated." Few schools had actually embraced technology wholeheartedly. For the most part, individual teacher's were still the primary force for technology implementation and use in schools across the country.

Prepared by the CEO Forum in Education and Technology, the 1997 National *STaR Assessment Report* surveyed 80,000 American schools. The report points to an increase in the number of computers and internet access in classrooms across the country, but also noted that 60% of America's schools currently possess outdated, inadequate technology. The report also noted that upgrading hardware and software was only the beginning because newer technology does not

guarantee better teaching or enhanced student learning. Poor technology training may help explain the STaR Report's most startling statistic. Based on their evaluation of school technology use, they report that only 3% of the nation's schools are "maximizing" their technology use (figures 6, 7, & 8): "classrooms that use technology wisely and integrate it into the curricula are hard to come by" (Viadero, 1997).

**Table 2.2 National STaR Assessment of Schools, Technology, and Use**



Not surprisingly, the report finds a need for greater professional development that helps teachers integrate computer technology into their curriculum and ultimately increase student learning. The report also cited the need for new evaluation tools that measure the actual impact of technology on students' learning.

**Table 2.3 STaR Characteristics of Low Technology Schools**

Limited Access: all computer ratio is higher than 13:1 student-to-multimedia computer ratio is over 25:1
Older technology: Only 49% of computers have processors equal to or greater than an Intel 386. 250 students per CD-ROM drive
Limited number of networked computers: 73% of these schools do not have access to a local area network (LAN)

**Table 2.4 STaR Characteristics of Maximized Technology School**

Ubiquitous computer access: students to all computer ratio of 3:1 students to multimedia computer ratio of 4:1
New technology: About 72% of all computers have processors equal to or greater than an Intel 386. There are about 9 students per CD-ROM drive.
Prevalent Networked Computers: There are about 7 students per computer connected to a LAN.

John Cradler's (1995) report for the Far West Educational Laboratory, *"Implementing Technology in Education: Recent Findings from Research and Evaluation Studies"* is one of the best educational technology implementation studies currently available. Cradler's evaluation of technology implementation in California school districts, is supported by research from "model" technology schools, national policy documents, state technology plans, two large technology studies conducted by the Far West Education Laboratory and the US Department of Education. Cradler presents his findings in four major areas:

- (1) Technology produced outcomes for teachers and students
- (2) Technology development and applications that support teacher learning
- (3) Local, state, and national factors for supporting technology applications.
- (4) Research and development for educational technology

Cradler points out that technology research has repeatedly found that "careful planning [that included teachers at all levels] is a prerequisite for the effective implementation of technology and telecommunications in education and training" (p. 1). A crucial part of the planning process is the identification of learning and

teaching needs, which he adds, the research studies show should take place before technology is identified and purchased. As Piele (1989) points out, the legacy of a “buy first, consider use after” policy has filled many district/school storage closets across the country when purchasing proceeded planning.

Cradler also argues that technology cannot be institutionalized when treated as an add-on to existing programs and curriculum. Successful institutionalization requires that technology be integrated systemically into schools and the curriculum. Teachers and principals should decide together how best to combine technology and the daily curriculum. In order to accomplish this, principals need to be technology literate leaders who can discuss the changes taking place in their schools and staff, as well as deal with problems and challenges that accompany technology implementation and use.

Cradler points to the Telemation Project as an example of successful technology implementation using systematic implementation. The project provided each teacher with a framework they used to plan their Classroom Telecommunications Intervention Plan (C-TIP). The framework defined four items that the technology resources could support: instructional strategies, curriculum objectives, student needs, and assessment strategies. Systematic planning for technology implementation provides:

- a rationale for the technology and related sources;
- the stakeholders get involved in the decision-making process;

- a way to promote thinking about the most cost-effective uses of technology;
- assurance that technology applications are aligned with the curriculum;
- help in determining the specific training and assistance needs;
- assurance that existing resources are used in the plan;
- a needed vehicle for procuring funding;
- a method for determining how to evaluate the impact and progress of the technology;
- a process for coordination with other programs and projects;
- that teaching addresses the needs of all learners;
- guidelines and a context for the insertion of new technologies;
- software developers with a definition of the technological needs of users.

Research by Meltzer and Sherman (1997) builds on Cradler's research.

They argue that the success of school-wide technology initiatives depends on the leadership the school principal provides. Their research found that at schools with "successful" technology initiatives, principals incorporated a variety of strategies that made them technology leaders:

- placed greater emphasis on learner-centered strategies;
- developed a clear school vision and philosophy for technology use;

- involved teachers in all aspects of planning and implementation;
- provided time for teachers and their students to use the technology;
- modeled teaching behaviors;
- promoted learning transfer;
- focused on real classroom applications;
- provided a technology coordinator;
- provided equipment and access;
- allowed time for teachers to play with technology.

### Summary

Three bodies of literature were reviewed in this chapter. Education reform literature served as both frame and the lens through which the literature on education policy implementation and educational technology implementation was reviewed (Figure 1.2).

Several things seem obvious from the literature reviewed. First, the educational reform and restructuring efforts since 1982 have proved one thing -- changing education is complex and difficult even in the best of circumstances. There are no silver bullets or quick fix remedies that policy makers can offer for what ails American education. Mandating a challenging curriculum or site-based management does not guarantee better schools, better teaching, or better students. More recent research shows that top-down policies are not always rejected at the local level as previously believed. Moreover, research shows that the success or

failure of many state education policies depends on the local perception of that policy. Is it beneficial to the district? Is it tangible to the stakeholders? Can be adapted to fit the district agenda or local needs? What will it cost? Is it funded or unfunded? Is it seen as just another political mandate?

This holds true for technology too. Historically, technology has failed miserably in American schools. Mandating that schools buy and employ computers in the classroom will not guarantee better schools, better teaching, better test scores or better jobs for our students upon graduation. The success of educational technology will require the concerted efforts of policy makers, local education agencies, teacher unions and organizations, administrators, teachers, students, parents, business partners, etc.



## Summary

Three bodies of literature were reviewed in this chapter. Education reform literature served as both frame and the lens through which the literature on education policy implementation and educational technology implementation was reviewed (Figure 1.2).

Several things seem obvious from the literature reviewed. First, the educational reform and restructuring efforts since 1982 have proved one thing -- changing education is complex and difficult even in the best of circumstances. There are no silver bullets or quick fix remedies that policy makers can offer for what ails American education. Mandating a challenging curriculum or site-based management does not guarantee better schools, better teaching, or better students. More recent research shows that top-down policies are not always rejected at the local level as previously believed. Moreover, research shows that the success or failure of many state education policies depends on the local perception of that policy. Is it beneficial to the district? Is it tangible to the stakeholders? Can be adapted to fit the district agenda or local needs? What will it cost? Is it funded or unfunded? Is it seen as just another political mandate?

This holds true for technology too. Historically, technology has failed miserably in American schools. Mandating that schools buy and employ computers in the classroom will not guarantee better schools, better teaching,

better test scores or better jobs for our students upon graduation. The success of educational technology will require the concerted efforts of policy makers, local education agencies, teacher unions and organizations, administrators, teachers, students, parents, business partners, etc.

## CHAPTER THREE METHODOLOGY

### Introduction and Overview

The purpose of this study was to examine the impact of recently enacted state technology reforms in the form of policies (guidelines, law, activities, and funding) on district technology efforts during the 1997-98 school year. Both quantitative and qualitative methods were used, creating what Patton (1990) refers to as a mixed methodological strategy. This strategy was employed to strengthen the study design through methodological triangulation (Patton, 1990). The quantitative data for this study came from three separate survey instruments. The 1997 and 1998 Louisiana Educational State Technology Surveys (*SETS*) were designed to annually gather district and school technology level data for the state. The third survey instrument, A District Evaluation of Recently Enacted State Educational Technology Policies (*DERST*), was specifically designed to gather district perceptions of the state's technology reforms that were implemented during the 1997-98 school year. Qualitative data were gathered through three case studies of three Louisiana public school districts.

### Quantitative Instrumentation and Data Collection

The 1996-97 and 1997-98 *SETS* instruments (Appendix A & B) were designed to gather data on district and school technology levels for the 1996-97

and 1997-98 school years, thereby providing data on district technology levels before and after new state technology reforms were implemented. *The DERST* instrument was designed to gather data on district perceptions of these new state technology policies during their initial year of implementation.

The 1996-97 *SETS* instrument was created and mailed out by the Governor's Office of Education to all of Louisiana's public and approved non-public schools in the Spring of 1997 (Appendix A). Schools were asked to fax or mail their surveys to the Governor's Office of Education or Qualitative Education Data (QED) in Denver, Colorado. QED provided the state with a summary report of the survey data in exchange for the right to use data from the state survey in QED publications.

The survey contained 20 questions with over 100 data points related to district and school level technology levels (e.g., computers, networks, internet connection locations, peripherals, computer locations). Classroom-Based Technology Funds (CBTF) for school district technology initiatives was directly tied to the survey's completion and return. Consequently, the response rate for the state's 1,482 public schools was 100% or 1482/1482.

The 1998 *SETS* instrument was mailed out to all of Louisiana's public schools in April of 1998 (Appendix B). Unlike the 1997 *SET* instrument, which was administered largely by the Governor's Office of Education and QED, the

1998 *SET* instrument was revised and administered by the Louisiana Center for Educational Technology (created by new state technology policy in August, 1997) and QED. Similar to 1997, state funding of district technology initiatives was also connected to the completion and return of the 1998 *SET* instrument. Districts had the option of completing the 1998 *SET* online at the Qualitative Education Data web site: (<http://survey.qeddata.com>).

The *DERST* instrument was created by the author of this study to gather data regarding district perceptions of state technology policy. Mailed out by the Governor's Office of Education to all sixty-six public school district technology coordinators, the instrument contained 46 questions with 64 data points (Appendix C). Each of the 66 public school district superintendents were also faxed a copy of the survey to ensure they were notified about the research being conducted within their districts. The technology coordinators were asked to anonymously complete and return the instrument by fax or mail within a two-week time frame.

Initially, 49 of the 66 surveys were returned. Since the surveys were anonymous and had no district identifier, a follow-up fax went out to all 66 district offices after the initial return deadline in an effort to increase the overall response rate. After this follow-up fax, thirteen more surveys were returned over a two-week time period, which meant that 63/66 districts returned 64 surveys (one

district had two district technology coordinators each complete a survey). This increased the overall response rate for the survey to 95.5%.

Questions for the *DERST* instrument were adapted from the 1997 and 1998 Louisiana State Educational Technology Surveys (SETS), the *Louisiana State Educational Technology Plan*, and the Southern Technology Council's 1997 study, *Making Technology Happen: Best Practices and Policies from Exemplary K-12 Schools*. In order for each item to represent only a single idea, the original wording of some items were modified and simplified. The basic structure of the instrument was adapted from the Hudson Institute's 1997 US Charter Schools Surveys (Hudson Institute, 1997) and the 1997 Southern Technology Council's survey (*Making Technology Happen*, 1997). The instrument attempts to gather data relevant to district perceptions of state educational technology reforms implemented in the 1997-98 school year.

The *DERST* instrument consisted of three sections that utilized Likert-scaled response statements, closed-ended questions, and three open-ended questions. Since there were some specific questions added to the 1998 *SETS* instrument that did not appear in the 1997 survey, Part One of the (*DERST*) instrument included questions that would provide similar data for the 1996-97 school year. Part One attempted to determine to what degree specific technology policy activities existed in school districts during the 1996-97 and 1997-98 school

years. The design of Part One required a response for each statement for both the 1996-97 and 1997-98 school years. A four-point Likert scale consistent with attitudinal scaling techniques (Drew & Hardman, 1985) was utilized in Part One (Table 3.1 & 3.2).

**Table 3.1 Part One Likert Scaling for 1996-97 Responses**

<b>1996-97</b>			
<b>Existed to a large degree</b>	<b>Existed to a moderate degree</b>	<b>Barely existed</b>	<b>Did not exist</b>
<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>

**Table 3.2 Part One Scaling for 1997-98 Responses**

<b>1997-98</b>			
<b>Exists to a large degree</b>	<b>Exists to a moderate degree</b>	<b>Barely exists</b>	<b>Does not exist</b>
<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>

Part One also included two closed-ended questions that asked respondents to approximate the percentage increase in technology spending for their district from 1996-97 to 1997-98.

Part Two of the DERST instrument was designed to gather district perceptions about 20 specific policy measures incorporated in the state's educational technology policy (e.g., state funding for technology and professional development, state recommendations, state requirements, and the Louisiana Center for Educational Technology). The response format for Part Two consisted

of a five-point Likert scale that required respondents to rate each specific state technology policy piece based on its benefit or lack thereof in relation to their district technology efforts during the 1997-98 school year (Table 3.3).

**Table 3.3 Part Two Likert Scaling**

<b>Highly Beneficial</b>	<b>Somewhat Beneficial</b>	<b>No Effect</b>	<b>A Hindrance</b>	<b>Don't Know</b>
4	3	2	1	DK

Part Two also contained one closed-ended question that asks respondents to identify and rank the top five most valuable state technology measures from the 20 policy measures contained in Part Two.

Part Three contained three open-ended questions that ask respondents to discuss the following three points as they pertain to their district's technology efforts during the 1997-98 school year:

- (1) factors contributing to their district's key success in 1997-98;
- (2) factor(s) that hindered their district's efforts in 1997-98;
- (3) the impact of specific state technology policies on their district's technology efforts.

### Validity and Reliability

Before the DERST instrument was administered, it was analyzed to increase face and content validity by the technology directors from the Louisiana Center for Educational Technology, the Southern Regional Education Board, the



Education Commission of the States, the Southwest Educational Development Laboratory, and the LSU College of Education (Litwin, 1995; Borg & Gall, 1985). Two former district technology coordinators from Louisiana public school districts, and two current district technology coordinators from Florida and Kentucky also reviewed the instrument. Dr. Jeanne Burns (Southeastern Louisiana University and the Governor's Office of Education), who played an integral role in the development of the state technology policy over the last several years, also reviewed the instrument. Each reviewer was asked to analyze the instrument and provide written and verbal feedback regarding issues of scaling, clarity, and content validity. Their comments and suggestions were used to revise the instrument before its administration.

In order to test the *DERST* instrument's reliability, six Louisiana district technology coordinators were asked to complete the technology policy survey a second time -- three to five days after they had initially completed the survey. Before the retest, survey questions were reordered, and response sets were reversed in order to limit any "practice effect" that might otherwise inflate test-retest reliability figures (Litwin, 1995). The test-retest reliability for the three respondents who completed the retest of the policy survey produced a correlation coefficient of  $r = 0.81$ .

### Quantitative Data Analysis

Descriptive statistics were utilized to initially analyze the data from all three surveys. Descriptive statistics provided the frequency of response the Likert scales, the percentages of responses in each item and the maximum possible score in the form of means and standard deviations. Data from the 1996-97 *SETS* were also used to establish district baseline technology levels prior to the state's technology reforms. Central values (mean, median, and mode) for district technology levels were also determined for the 1996-97 and 1997-98 school years using data from *SETS*.

The multimedia computer to student ratio for each district (taken from the 1996-97 *SETS* data) was used to create and place districts in one of three categories:

- districts with below average levels of technology;
- districts with average levels of technology;
- districts with above average levels of technology.

Data from the 1996-97 and 1997-98 *SETS* instruments were also compared to determine how district technology levels changed (increased or decreased) from 1996-97 to 1997-98.

*Analysis of Variance (ANOVA)* was used to determine if there was any significant difference between district responses to questions in the *DERST* instrument when districts were placed in the following sets of sub-groups:

- district type - rural, suburban and urban districts;
- district size - small, medium, and large districts;
- district technology levels - average, below average, above average.

### Case Studies

Cross-case analysis (Herriot and Firestone, 1983; Yin, 1990) was utilized to develop and analyze data from case studies on three public school districts. Three districts were selected, one from each group established in phase one of the quantitative analysis of the 1996-97 state technology survey data (Table 3. ).

Table 3.4 Case Study District Selection Categories

Districts Chosen	District Technology Category	Schools
One	" <u>Above</u> average levels of technology"	Two
One	" <u>Average</u> levels of technology"	Two
One	" <u>Below</u> average levels of technology"	Two

Protocol for the case studies included interviews and on-site visits to each district along with on-site visits to two schools in each district that were randomly chosen from the pool of schools within each district that received state technology dollars during the 1997-98 school year. A team composed of the primary researcher and another graduate student collected this data. This increased the reliability for observed evidence (Yin, 1990).

Interviews were conducted with each district's technology coordinator(s) using a focused interview technique. The interview questions were derived from

two sources: (1) the DERST instrument, and (2) Hall's and Hord's (1987) "stages of concern."

- What are your general reactions to the state's technology reforms?
- What changes, if any, would you like to see made to the state technology reforms? Why?
- What questions do you have about the state technology reforms?
- What aspects of the state technology reforms have hindered your district's technology efforts? Why?
- What aspects of the state technology reforms have been beneficial to your district's technology efforts? Why?
- I am interested in any thoughts you might have about the state technology reforms.

### Case Study Data Analysis

Content analysis was then utilized to analyze case study data and determine emerging themes and patterns (Patton, 1990; Yin, 1984; Miles, 1990). The data were reported in the form of case studies and provided insight into the impact of state technology reforms on district technology efforts during the 1997-98 school year.

## CHAPTER 4 RESULTS

### Overview

This dissertation examined the reported impact of state technology policy on district educational technology efforts. This examination was conducted three ways: (1) measuring district technology levels the year before and the year after the implementation of state technology policies, (2) measuring district perceptions of specific state technology policies implemented in the 1997-98 school year, and (3) conducting case studies in three public school districts.

Data regarding district/school technology levels were collected by the state in the *SETS* instrument during the 1996-97 (the year prior to state funding) and 1997-98 (the first year of state funding) school years. As mentioned in the previous section, both the 1996-97 and 1997-98 *SETS* instruments were administered for the state by Qualitative Education Data (QED). Descriptive statistics were utilized to analyze these data.

The district perceptions of the state's educational technology policies implemented in the 1997-98 school year, were measured at the end of the 1997-98 school year using the *DERST* instrument, a state designed instrument, administered by the Governor's Office of Education. Descriptive statistics, paired-samples t-tests, crosstabs, and analysis of variance (ANOVA) were utilized to analyze the data collected by this instrument.

### Response Rates

As discussed in the previous section, sampling was not utilized in this study because the three instruments were administered to the total populations being studied. Table 4.1 summarizes the populations and response rates for all three survey instruments. The response rate for the 1996-97 *SETS* was 100% (1,432/ 1,432 schools). The 1997-98 *SETS* had a slightly lower response rate of 96.7%. The response rate for the *DERST* was 95.5% (63/66 districts responded). Sixty-three public school districts returned 64 surveys. One of the 63 districts had both of their technology coordinators complete and return one survey each. These two survey responses were averaged together in order to serve as the district's single response.

**Table 4.1 Sample Response Rates**

Instruments	Total Population	Survey Responses		Final Sample	
<i>1997 Louisiana Educational Technology Survey (SETS97)</i>	1,432 Public Schools	1,442	100%	1,432	100%
<i>1998 Louisiana Educational Technology Survey (SETS98)</i>	1,432 Public Schools	1,385	96.7%	1,385	96.7%
<i>1998 District Evaluation of State Technology Policies (DERST)</i>	66 Public School Districts	64*	96.9%	63	95.5%

\*64 surveys were returned by 63 districts. Two survey responses from the same district were averaged together.

### Louisiana State Educational Technology Survey Data: 1996-97 and 1997-98

The 1996-97 and 1997-98 *SETS* instruments were designed to gather data on school technology levels. Schools were asked to report on the following specific technology related items:

- hardware & peripheral numbers (e.g., computers, printers, cameras)
- internet connections and locations
- local & wide area networks connections
- computer locations (e.g., labs, libraries, classrooms)
- number of computers
- number by manufacturers and models (Mac or PC)
- number of multimedia computers
- number of internet capable computers
- technical personnel at district and school
- teacher skill levels
- funding sources and amounts
- professional development

#### District Technology Levels

Between the 1996-97 and 1997-98 school years, district data showed that the levels of technology related hardware in public school districts across the state grew substantially. For example, based on district reported data, the Louisiana student to multimedia computer ratio was 39.6 to 1 in 1997. A year later, district reported data showed that the student to multimedia computer ratio had dropped significantly to 15.3 to 1 (Table 4.2).

Table 4.2 Student/Computer Ratios

<b>LOUISIANA COMPUTER RATIOS</b>	<b>1996-97</b>	<b>1997-98</b>
Students to All Computers	11.4 to 1	7.9 to 1
Students to High-End Computers	23.3 to 1	17.3 to 1
Students to Multimedia Computers	39.6 to 1	15.3 to 1

In the 1996-97 school year less than 500 schools were connected to local and wide area networks. District data revealed a significant increase in the number of schools connected to local and wide area networks in the 1997-98 school year (Table 4.3).

Table 4.3 School Internet &amp; Network Connectivity Levels

<b>SCHOOL CONNECTIVITY</b>	<b>1996-97</b>	<b>1997-98</b>	<b>DIFFERENCE</b>
Schools With Internet Access	825	1,106	+34%
Schools Connected to Local Area Networks	487	779	+60%
Schools Connected to Wide Area Networks	405	892	+120%

District reported data also showed that the number of peripheral devices increased with the exception of laserdisc players, which actually dropped slightly (Table 4.4). The number of digital cameras increased significantly.

Table 4.4 Peripheral Technology Levels

<b>PERIPHERAL TECHNOLOGIES</b>	<b>1996-97</b>	<b>1997-98</b>	<b>DIFFERENCE</b>
Computer Projection Devices	1,675	1,857	+10.9%
Digital Cameras	405	741	+83.0%
Graphing Calculators	14,419	19,823	+37.5%
Laserdisc Players	1,734	1,586	-8.5%



### District Perceptions of State Technology Policy

Descriptive Statistics, paired-samples t-tests, crosstabs, and analysis of variance (ANOVA) were used to analyze data collected by the *DERST* instrument. The instrument was divided into three sections that were designed to gather data regarding district perceptions of state technology policies implemented during the 1997-98 school year (Appendix E). Paired-samples t-test and analysis of variance were used to analyze the data from Part One to determine differences in district responses for the 1996-97 and 1997-98 school year.

#### Part One Analysis

##### Paired-Samples T-Test

The paired-samples t-test was used to determine the differences in how districts responded to questions (1-18) in Part One of the technology policy survey. This section required districts to provide a response to each question for two school years: 1996-97 and 1997-98. Questions 1-18 asked districts "to what degree" specific technology policy elements existed in their respective districts in each of the two school years -- 1996-97 and 1997-98. The scale for Part One responses is shown below in tables 4.5 and 4.6

Table 4.5 *DERST* Part One Scale for 1996-97

1996-97			
Existed to a large degree	Existed to a moderate degree	Barely existed	Did not exist
3	2	1	0

Table 4.6 *DERST* Part One Scale for 1997-98

1997-98			
Exists to a large degree	Exists to a moderate degree	Barely exists	Does not exist
3	2	1	0

## Results

The paired-samples t-test analysis revealed a significant difference between district responses for all 18 questions in Part One of the Policy Survey (Table 4.7). This difference suggests that these policy activities and measures increased significantly from 1996-97 to 1997-98.

Table 4.7 Paired-Samples T-Test for Part One - Technology Policy Survey

Questions 1-18	Paired Differences	Std. Deviation	95% Confidence Interval of the Difference		t	Sig. (2-tailed)
	Mean		Lower	Upper		
1	.98	.93	.75	1.22	8.429	.000
2	1.02	.95	.78	1.25	8.543	.000
3	.80	.80	.60	1.00	7.965	.000
4	.81	.66	.65	.98	9.794	.000
5	.72	.74	.53	.90	7.721	.000
6	.91	.85	.70	1.13	8.578	.000
7	.69	.76	.50	.89	7.191	.000
8	1.00	.78	.81	1.19	10.301	.000
9	1.34	.84	1.13	1.55	12.800	.000
10	.87	.81	.67	1.08	8.523	.000
11	.94	.59	.79	1.09	12.551	.000
12	.95	.55	.82	1.09	13.936	.000
13	.84	.51	.71	.97	12.978	.000
14	.98	.72	.80	1.17	10.883	.000
15	.95	.70	.78	1.13	10.895	.000
16	.40	.58	.25	.54	5.509	.000
17	.64	.68	.47	.81	7.589	.000
18	1.39	.99	1.14	1.64	11.284	.000

Note: n=63. The mean score corresponds to the scale: 1=Existed to a Large Degree; 2=Existed to a Moderate Degree; 3=Barely Existed; 4=Did not Exist.

### Analysis of Variance

One-Way Analyses of Variance (ANOVA) was used to determine if there was any significant difference between district responses with respect to questions in the technology policy survey when districts were placed in the following sets of sub-groups:

- district type - rural, suburban and urban districts;
- district size - small, medium, and large districts;
- district technology levels - average, below average, above average.

For the one-way ANOVA, Tukey's Highly Significant Difference (HSD) used to test significance. Significant variance ( $p \leq .01$ ) was found only in districts grouped by type (rural, suburban, and urban). Furthermore, significant difference was limited to only six questions from Part One of the *DERST* instrument (Appendix E).

### Significant Responses

In response to the existence of local school board awareness of enhanced technologies there was a significant difference ( $p \leq .008$ ) between rural and urban public school district responses for the 1996-97 school. District responses for the 1997-98 school year revealed no significant differences between any of the three groups.

In response to "district personnel who can support and maintain district/school technical infrastructure (i.e., servers, hardware, wiring)," there was

a significant difference between rural and suburban districts ( $p \leq .001$ ), as well as rural and urban districts ( $p \leq .000$ ) for the 1996-97 school year. For the 1997-98 school year, there was only a significant difference between rural and urban districts.

In response to “what degree ongoing technology training opportunities for teachers existed”, there was significant difference between the responses of rural and suburban districts ( $p \leq .001$ ), as well as rural and urban districts ( $p \leq .002$ ) for the 1996-97 school year. No significant difference existed between the three groups for the 1997-98 school year.

In response to the “existence of a significant numbers of teachers (50% or more) effectively using technology with their students”, there was a significant difference between rural and suburban districts ( $p \leq .004$ ), as well as rural and urban districts ( $p \leq .008$ ) for the 1996-97 school year. No significant difference existed between the three groups for the 1997-98 school year.

In response to “opportunities for students to apply state-of-the art technology to critical thinking and problem solving,” there was no significant difference in district responses for the 1996-97 school year. There was a significant difference between rural and urban districts ( $p \leq .008$ ) for the 1997-98 year.

In response to “increased classroom-based technology as opposed to lab based technology,” there was a significant difference between rural and suburban

( $p \leq .004$ ), as well as rural and urban districts ( $p \leq .003$ ) for the 1996-97 school year. For the 1997-98 school year, there was a significant difference between rural and urban districts ( $p \leq .006$ ).

### District Evaluation of Policy Measures

In Part Two, districts were asked to rate specific state technology policies (e.g., requirements, recommendations, grant process, LCET) based on their degree of benefit to district technology efforts. The 20 policy measures can be placed in four general categories:

- state recommendations;
- state requirements;
- the Louisiana Center for Educational Technology;
- Classroom-Based Technology Fund.

Descriptive statistics and crosstabs were used to analyze data from this section. Only three of the 40 policy measures had a mean response below 3.00 (Table 4.8). The policy measures that received the ten highest mean responses are listed in Table 4.9.

**Table 4.8 Policy Measures With A Mean Response Below 3.00**

<b>PART TWO: POLICY COMPONENT BENEFIT 21-40</b>	<b>MEAN</b>
Half-day "Technology Workshops" for educators	2.96
State recommendations for district area networks	2.72
Louisiana NetDay Teleconference	2.50

Note: Scale for #21-40 was 4=High Beneficial; 3=Somewhat Beneficial; 2=No Effect; 1=A Hindrance; 9=Don't Know. "Don't Know" responses were excluded in the MEAN calculation

Table 4.9 Top Ten Policy Measures Ranked By Mean Response (#21-40)

<b>PART TWO: POLICY COMPONENT BENEFIT</b>	<b>Mean</b>	<b>Mode</b>	<b>Median</b>
Extra funding for technology training and professional development	4.00	4	4.00
Extra state funding for hardware and software	3.97	4	4.00
The Louisiana Center for Educational Technology (LCET)	3.73	4	4.00
E-Rate information meetings (An LCET Function)	3.52	4	4.00
Review and evaluation of each district technology plan during the state's technology grant process	3.46	4	4.00
State-required items that each district technology plan must possess	3.38	4	3.00
State recommendation to participate in a regional technology cooperative	3.34	4	3.00
State-required items that each school technology plan must possess	3.31	3	3.00
State recommended strategies for technology implementation and integration with the curriculum	3.21	3	3.00
State recommended local & district strategies for effective use of technology funding and resources	3.18	3	3.00

Note: Scale for #21-40 was 4=High Beneficial; 3=Somewhat Beneficial; 2=No Effect; 1=A Hindrance; 9=Don't Know. "Don't Know" responses were excluded in the MEAN calculation.

### Ranking the Value of Policy Measures

The last question in Part Two (#41) asked districts to rank what they considered to be the five most valuable policy measures from the 20 policy measures presented in Part Two. Descriptive statistics and crosstabs were used to examine the data from these two questions. Districts clearly chose extra funding (#30 & #31) as the top two policy measures (Table 4.10). In rankings three, four, and five, no one policy measure receive a significant number of district responses.

Table 4.10 Ranking for the Top Five Policy Measures

Rank	Policy Measure	n	f	Valid Percent 61=100%	Responses by District Type		
					Rural	Suburban	Urban
1	Extra state funding for hardware and software	61	40	65.6%	13	15	12
2	Extra funding for technology training	61	39	63.9%	12	15	12

### Technology Funding and Expenditures

Four different questions (19, 20, 30, 31) in the policy instrument dealt with funding. In questions 19 and 20, districts were asked to estimate how much district-level spending for technology increased from the 1996-97 school year to the 1997-98 school year in two areas:

- Hardware/software/wiring, etc.;
- Training and professional development.

Only 59 of the 63 districts that completed the surveys responded to questions 19 and 20. Follow-up phone calls were made to three of the four district coordinators who did not respond to questions 19 and 20. All three coordinators stated that they had not answered the two funding questions because they just were not sure how much more money was spent on technology in their districts. They each cited a difficulty in determining the total increase in funding because so many different sources (e.g., state and federal grants, local tax dollars, donations, business partnerships) were tapped. The response scale for questions 19 and 20 was 1=0-25%; 2=26-50%; 3=51-75%; 4=76-100%; 5=101-150%;

6=151-200%; 7=201%. The data revealed that between urban, suburban, and rural districts, rural districts reported slightly higher increases in 1997-98 technology funding for both technology hardware and technology professional development (Table 4.11).

Table 4.11 Mean Response for Questions #19 & 20 (All Districts)

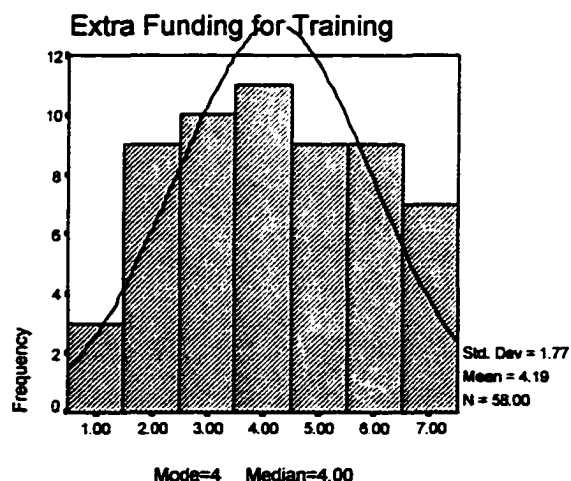
District Type	#19 State Funding for Hardware/Software		#20 Extra Funding for Training	
	Mean	Median	Mean	Median
Rural	4.35	4.00	4.74	4.00
Urban	4.20	4.00	4.25	4.00
Suburban	4.00	4.00	4.35	4.00

NOTE: n=58

Approximately 61% of the districts reported that their increase district expenditures for technology hardware & software increased over 76% for the 1997-98 school year. 42.1% of the districts reported a gain in funding of 101% or more (Table 4.12).

Table 4.12  
Response Frequency #19

Variable (% Increase)	Frequency	Valid Percent
1=0-25%	3	5.2%
2=26-50%	9	15.5%
3=51-75%	10	17.2%
4=76-100%	11	19.0%
5=101-150%	9	15.5%
6=151-200%	9	15.5%
7=201%+	7	12.1%

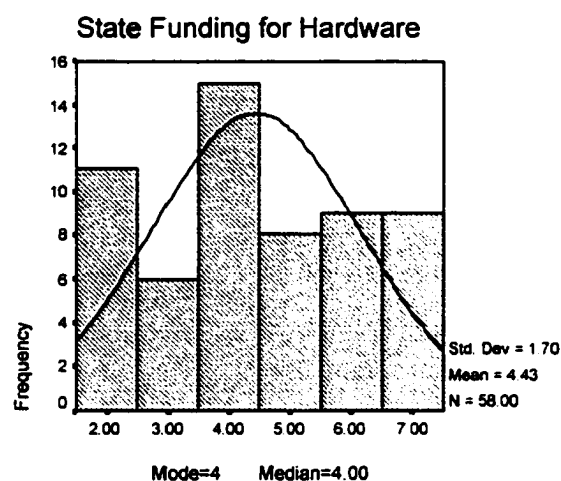




Over 70% of the districts reported that expenditures for training related technology increased by 76% or more. While 43.1% reported gains of 101% or more (Table 4.13).

Table 4.13  
Response Frequency #20

Variable	Frequency	Valid Percent
1	0	0.0%
2	11	19.0%
3	6	10.3%
4	15	25.9%
5	8	13.8%
6	9	15.5%
7	9	15.5%



Questions 30 and 31 (Part Two) asked districts to rate the benefit of extra state funding for technology hardware and technology training that became available for the 1997-98 school year through the Classroom-Based Technology Fund and the Technology Literacy Challenge Fund. Of all the policy measures evaluated, these two policy measures related to funding received the highest mean responses from districts (Table 4.14).

Table 4.14 Mean Response for Questions #30 & 31

Question Number and Description	n	Mode	Mean	Median	Std. Dev.
#30 Extra State funding for hardware	63	4	3.97	4.00	
#31 Extra funding for training	63	4	4.00	4.00	

NOTE: Scale: 4=Highly Beneficial; 3=Somewhat Beneficial; 2=No Effect; 1=A Hindrance; 0=Don't know.

### Open-ended Responses

There were three open-ended questions in Part Three of the DERST instrument. The first question asked districts to discuss the factors underlying their district's technology successes in the 1997-98 school year. Extra funding for hardware and professional development was mentioned by almost every respondent.

The second question asked districts to discuss factors that hindered their technology efforts in the 1997-98 school year. Only two factors were mentioned by districts: the CBTF grant application and the time-line for grant funding.

The third question asked districts to describe positive or negative impacts of the state's technology policies. Extra funding was mentioned by almost all of the districts. The Louisiana Center for Educational Technology also received a significant amount (>50%) of positive response.

### Summary

Quantitative data were coded and entered into Excel spreadsheets and then imported in to SPSS 8.0 for statistical analysis. One-way analysis of variance (Tukey HSD), pair-samples t-test, crosstabs, and descriptive statistics were used to answer three of the four research questions. Significant results based on these statistical analyses are discussed in Chapter 6.

## CHAPTER FIVE

### CASE STUDIES OF THREE LOUISIANA PUBLIC SCHOOL DISTRICTS

#### Introduction

Case studies for this study were conducted in three Louisiana public school districts. Each of the three districts were randomly selected from one of three categories that ranked Louisiana districts by their 1996-97 student to multimedia computer ratio.

- Districts with Above Average Student to Multimedia Computer Levels
- Districts with Average Student to Multimedia Computer Levels
- Districts with Below Average Student to Multimedia Computer Levels

The 1997 Louisiana public school district average ratio for students to multimedia computers was 39.6 to 1 (QED, 1997). At the low end of that range, one district reported no multimedia computers for their students in 1997. At the high end of that range, a district reported a 5 to 1 student to multimedia computer ratio (Appendix). Data for these three case studies were collected from interviews, visitations, and observations. The research team was comprised two people: the primary researcher and a fellow graduate student. Data was cross validated after visitations in an effort to increase case study reliability (Yin, 94).

### Research Access

In order to gain access to three school districts, district school superintendents were contacted by phone and mailed a research permission slip that they, in turned, faxed back to the researcher. Many district staff members were unavailable until early June and July, due to summer workshops, conferences, and vacations. Consequently, the district selection was affected by superintendent permission, staff availability, and scheduling. The names of each district, their schools, and their personnel have been changed to preserve anonymity.

### The Interviews

The case study protocol involved pre-arranged semi-structured interviews with the district technology coordinators from each of three districts, as well as on-site visits to at least two of each district's schools that received Classroom-Based Technology Funds during the 1997-98 school year.

The interview questions were given to the district technology coordinators a few days prior to the actual interview date to allow them time to think about the questions. The actual interview process was conducted in person at the district central office and took one to two hours. Interviews were taped when permission to do so was granted. Follow-up phone calls and visits were later used to clarify any questions regarding the interview data. The interview questions were adapted

from Hall and Hord's (1986) "Levels of Concern" model and focused on aspects of the state's technology policies:

- What are your general reactions to the state's technology policies?
- What changes, if any, would you like to see made to the state technology policy? Why?
- What questions do you have about the state technology policies?
- What aspects of the state technology policies have hindered your district's technology efforts? Why?
- What aspects of the state technology policies have been beneficial to your district's technology efforts? Why?
- I am interested in any thoughts you might have about the state technology policies.

### School Visits

School visitations and classroom observations were conducted during two sets of one-day visits to each district. The district/school visitations were completed on the same day the interviews with district technology coordinators were administered. The classroom observations took place about a month later, shortly after the new school year began.

Each district's technology coordinator orchestrated the on-site school visits. At each school, a brief introductory meeting took place between the research team, the district technology coordinator and each school's principal. After this meeting, the district technology coordinators showed the data collection team areas in each school to illustrate how and where CBTF funds had been used

to buy and install hardware (e.g., wiring, computers, printers) and software. In one district, each school also had a school-level technology coordinator who was asked by the district technology coordinator to accompany us around the school.

### Case Study One - Alsace Parish

Alsace parish is one of Louisiana's smaller, rural parishes. Located in Northern Louisiana, the parish economy is almost exclusively agricultural. 1998 has been an especially difficult year for the parish's economy because of severe drought conditions. The Alsace parish school district has six schools: three elementary, one middle school, and two high schools that serve approximately 2,000 students -- 90% of whom qualify for free and reduced lunch. The average per capita income in the parish is approximately \$14,000, while the unemployment rate is over 20% (NELU, 1996). The school district receives approximately \$250,000 dollars per year from local taxes. Average annual salary for teachers is approximately \$25,000.

At the beginning of the 1996-97 school year, the Alsace Parish School District had no district technology plan, no technology infrastructure (hardware, wiring, and support personnel) no district technology coordinator, and no high-end, multimedia computers in any of their public schools.

Alsace Parish created the district technology coordinator position during the 1996-97 school year. The position was subsequently filled by the same woman who also served as the district's Title One Coordinator -- Ms. Olivia

Johnson. Previous to being the Title One Coordinator, she taught at one of the parish's elementary schools for eighteen years. In 1997-98 the parish received approximately \$70,000 through the Classroom-Based Technology Fund.

### The Interview

The interview with Ms. Johnson took place in her office at the parish school board building. She explained she was little nervous and excited about my visit because "this was the first time anyone from outside the parish had come in to conduct research on their district's technology efforts." She even called the local newspaper to let them know that someone from Baton Rouge had come up to conduct research in their schools. After her call to the local paper, Ms. Johnson went on to explain that she was proud of what they had been able to accomplish in such a short time, but that she was also somewhat apprehensive because of the "bumps" she knew that were undoubtedly ahead.

She expressed strong support for the state's technology policies because "without them" she explained, "our parish would have had no idea where to begin or what to do, and we certainly would have been hard pressed to find the funds to accomplish what we have so far." She went on to explain that the state recommendations for hardware specifications (wiring, connections, servers, and networks) and requirements for district and school technology plans and professional development incorporated in the state technology plan and the Classroom Based Technology Grant process had "provided them with a framework they would have had difficulties developing on their own."

She also explained that Louisiana Center for Educational Technology had been an invaluable resource throughout the 1997-98 school year: “Any time we had a question about anything from wiring to software, someone at the LCET would provide us with help. I don’t know what we would have done without them because there was really no one in our parish who had such expertise.”

With respect to changes in the state’s current technology policies, the only thing she thought needed changing was the actual Classroom-Based Technology Fund grant application:

It was the hardest grant application I or any of the district staff had ever attempted to complete. . . . It was so specific and yet repetitive, asking us to explain what were going to do and how we were going to it in three different parts of the application. And there were things in it (e.g., software choices and student evaluations) that we need more time to think about. We’re just getting our technology initiative started. We just haven’t had time to consider software yet. We don’t want to rush in and buy software we are not sure about. How could we possibly know the answers to some of those questions yet?

Even so, Ms. Johnson also expressed her gratitude for the Classroom-Based Technology Funds they received from the state. However, she also expressed her concern about continued state funding for educational technology in the future “because they [the legislators] had already cut the CBTF Funding by \$12 million dollars from the first year to the second year. If they keep cutting it or eliminate the funding completely, we will have a hard time moving forward with our plan.”

She also inquired about the Federal E-Rate Discount: She explained that “the planning of our district technology budget was partly based on our E-Rate discount. Classroom Based Technology Grant funds were used exclusively to wire



schools and classrooms, while funds from our E-Rate discount (90%) will be used to buy classroom computers and complete district area network.”

### School Visits

Ms. Johnson began by taking us to her district’s new technology training center located in a refurbished school building that was part of larger elementary school complex. This same building also housed the parish parental training center. The parish used LEARN grant funds and Title One funds received in 1997 to outfit the center with 20 multimedia computers, a large screen television, several printers, and a computer projector. All the computers were connected to the internet through a T-1 line that was also connected to three of the parish’s six schools. The center was available at various times of the day for student use, teacher training, and community use. Two full-time staff members and several part-time staff members worked in the center and provide training.

The center provides teachers with five levels of technology training that ranged from beginner to expert. Each participant receives pre and post evaluation to determine their level of expertise before and after each level of training is completed. So far half (approximately 75) of the teachers in the parish had participated in technology focused professional development at the center during its first year of operation (1997-98).

After visiting the center, we visited two schools – one elementary and one middle school. The elementary school was located next door to the parish technology training center. Each classroom had been wired with five internet

drops (connections). Each room had one multimedia computer on a table or cart for teacher/student use, but not all of the classroom computers were connected to the internet yet – a fact that seemed to surprise Ms. Johnson. When Ms. Johnson asked one of the teachers why her computer was not connected yet, the teacher said, “no one has installed the cable that connects the computer to the drop connector.” When we left the room, Ms. Johnson expressed her frustration with the situation because she said, “all someone has to do is plug in one cable between the computer and the wall mounted internet drop.” After visiting several classrooms, we went to the library where new computers were being assembled and readied for use by one librarian and one teacher. Ms. Johnson explained that

things were moving much slower than she would like, but she was only one person with limited resources and the school personnel had very limited technology expertise if any at all. Since the district had no person responsible for hardware support or maintenance like some districts, it fell on her shoulders and the shoulders of the staff at the schools to do the best job they could.

At the middle school, Ms. Johnson took us to the new computer lab, which we could not enter because it was being used by a study hall. Ms. Johnson asked the teacher in charge why the study hall was occupying the computer lab. She was told that due to a lack of classroom space, the principal had scheduled the study hall in the lab until a temporary building could be setup. At this point, Ms. Johnson was clearly agitated. She proceeded to the office where she discussed the use of the lab with three different people, including the principal, who invited us to come back at a later date to see the lab being used as it was intended.

Afterwards, Ms. Johnson expressed her frustration regarding leadership at some of the parish's schools. She said, "we're hoping that some them will retire soon."

### Summary

Ms. Johnson seemed to be the primary force driving the district's technology efforts. She seemed responsible for every aspect of the district's technology efforts: writing grants, coordinating the use of various funds, purchasing hardware and software, coordinating the installation of hardware for the district and the schools. The district had made some huge strides, considering that no district or school technology plan or infrastructure even existed until 1997.

- All the schools were wired for internet access
- Each class had five internet drops (connections)
- Three of schools were already been connected to a T-1 line that would eventually connect all the schools in a district area network.
- Each class had one high-end multimedia computer
- A Technology Training Center had been established
- A District Area Network was partly constructed

However, it also quite obvious the district and its schools were experiencing their share of difficulties. When we returned in August after school started, we only found one class in twelve (at two schools) where students were using the computer. In other classes the computers sat in the back of the rooms -- in many cases turned off. Many of the computers were still not connected to the internet drop available in the class.

When we were introduced to teachers in these rooms, they had little if anything to say about the new computers – no questions, no comments. The administration at these schools also seemed largely indifferent too. Neither principal we talked with offered any words of excitement or support for the technology being installed in their schools. They just wondered why we were there. One principal followed us around opening doors as we toured his school, but he never entered the conversation. This seemed highly unusual considering the excitement of teachers and administrators in other parishes we visited.

#### Case Study Two - Lorraine Parish

Located in the central Louisiana, Lorraine Parish is one of the state's rural parishes. The parish has approximately 23,00 residents with an average per capita income of approximately \$16,500 (NELU, 1996). The unemployment rate is approximately 8.8% (NELU, 1996). The parish economy is based on mix agriculture and local industry. Local industry has been quite supportive of the school district's efforts to improve the local schools.

The school district has eight schools – six elementary schools, two middle schools, and two high schools that serve approximately 3,000 students. Average annual salary for teachers in the parish is \$27,500. Each of the eight school board members has one of the eight schools in his or her district, which creates some unique political considerations for the central office. For example, after the district received approximately \$140,000 in Classroom-Based Technology Funds for the 1997-98 school year, they had to decide which schools would receive the

money. The state had recommended that first-year CBTF Funds be targeted to a few specific schools within each district for maximum impact, and the vast majority of the public school districts decided to follow this recommendation. In Lorraine Parish, a decision was made by central office to divide the Classroom-Based Technology Funds evenly between each of the eight schools in the district (\$16,000 per school). Ms. Jones, the district technology coordinator, said, “that by giving money to each school we avoided the political battle and subsequent fallout that would surely erupt on the school board if some schools received funding while others did not.” The central office also made the decision regarding the way in which Classroom-Based Technology Funds would be spent at their eight schools.

The Lorraine parish schools completed the first phase of their district technology plan (creating a district infrastructure) when every school and classroom was wired for internet access with donated materials and labor in 1997. Consequently, all of the Classroom-Based Technology Funds were used to purchase computers and peripherals (LCD panels, scanners, printers, etc.) for classroom use. Each of the eight schools received two multimedia workstations that were placed in two classrooms with teachers that had received intensive technology professional development (40 hours) in January and February of 1998. Both computers in the each workstation were connected to the internet and contained the following hardware and software:

- Two high-end multimedia computers (one for teacher use)

- one color ink-jet printer
- one color scanner
- one LCD display panel
- one high quality overhead projector for use with LCD panel
- one VCR
- one large screen television
- Microsoft Office 97 (Power Point, Excel, Word, Access)
- E-Mail software
- one workstation cart for the teacher's compute
- one digital camera /two workstations

One of the two computers was designated "for teacher use only." This teacher computer was situated on a multimedia cart. The cart provided flexibility so that the teacher could use the computer anywhere in or out of the classroom. We saw teachers move the cart around their rooms, using the computer as both an administrative tool at their desks (e.g., record keeping, research, lesson planning) and as an instructional tool (e.g., presentations, internet explorations) in conjunction with the LCD display and an overhead.

Before receiving their multimedia workstations in the Spring of 1998, sixteen teachers were selected to serve as the district's "Core Teachers." Core teachers received 39 hours of technology professional development over the Winter of 1997. The teachers were selected from the district's pool of Reading and Language Arts teachers. They had varying levels of teaching experience.

Core teachers were required to conduct teacher training at their schools and the district technology training center. The district provides core teachers with extra pay for their training services.

Along with two teachers in every school receiving two multimedia workstations, two other teachers at each school were selected and trained to serve as school technicians. Training teachers to serve as school technicians served two purposes. First, the teachers with the workstations in the rooms had technical support available at their schools whenever technical problems inevitably arose. Second, someone was available at each school for routine maintenance, emergencies, and the installation of new hardware when it became available. This, in turn, freed up the teachers and the district technology coordinator to focus the instructional side of technology (e.g., planning and integration). At the time of the interview, the district had provided a large number of their school personnel with technology training during the spring of 1998 (Table 5.1).

**Table 5.1 Lorraine Parish District Technology Training**

<b>Personnel Trained</b>	<b>Hours of Training</b>	<b>Number Trained</b>
Core Teachers	39	16
School Technicians	30	16
Other Teachers	18	60
Principals	24	8
Central Office Administrators	24	8

### The Interview

Like other technology coordinators in smaller rural parishes, Ms. Jones was not just the district technology coordinator. She was also the Title One Coordinator for her parish.

With regards to state technology policies, Ms. Jones felt that the state technology policies had been a great benefit to her district. She said, “The state requirement that the district and each school receiving funds have a technology plan was big plus for us. It really helped us focus district and school technology funding based on where we thought it best serve our students and teachers.”

Ms. Jones went on to say that , “At the middle and secondary levels, we chose to focus our initial entry into classroom technology at reading and language arts classes. This where our kids’ test scores seem to reflect the greatest need.”

Ms. Jones also expressed her support for the state’s technology policy, especially state funding, which she felt had been a huge benefit to her district:

Phase one of our district technology plan involved the construction of our district and school technology infrastructure. Since we were able to do this almost cost free through NetDay, we were able to move directly into phase two of our district plan. CBTF monies allowed to purchase multimedia stations for sixteen teachers, which put us a year ahead of where we thought we would be.

As far as her concerns with state policies, she expressed concern for continued state technology funding over the next few years. She said, the money we received last year really helped us get things rolling, but it’s only a beginning for us. We are going to need a lot more to reach our district technology goals.”



She also felt quite frustrated with the Classroom-Based Technology Fund grant application, which she talked a lot about:

The directions were sometimes vague and unclear. They specifically limit applicants to 25 pages, which means you have to be to be concise and short. But then they require a written a narrative where everything you are intending to do during the next year must spelled out. In the next section, you are required to put all the elements from the narrative in a chart. Then, to make matters even worse, you have to argue the feasibility of the same elements in a third section. It seemed terribly redundant to me, and it made it quite difficult to stay in the page limit. We spent a lot of valuable time completing the application. It required more time than any grant application I or any member of our staff have ever attempted.

While the application presented something of a problem, Ms. Jones spoke very highly of the LCET and its staff. She said, “Every time I call there -- and I call there a lot – they have been more than willing to help answer any questions I might have. The folks there have also provided us with some great information and ideas regarding technology integration.” With regards to problems that hindered her district’s technology efforts, she said:

I think that we face many of the same problems other smaller rural districts face: funding, technical expertise, and salaries. We lost half of our teachers last year – most the them to the higher paying school districts that neighbor us. I know the same thing is happening in other small districts. It makes it very hard to develop a highly trained core staff of teachers at our schools when they can get so much more pay in other districts and states. But, what can I do?”

When we talked again, several weeks after the interview, Ms. Jones said “I just lost two of last year’s core technology teachers to promotions within our district. I’m excited for them, but now I have to train two more teachers to just to replace

them. Every time we take two steps forward, we always seem to take at least one step back!”

### School Visits

We visited two schools in Lorraine Parish -- one elementary and one secondary. At the secondary school, we met with the school’s principal before visiting the school’s two core teachers. The principal talked with us briefly. He was polite, but never asked any questions or made any comments about the district or school technology efforts.

We planned on visiting both core teachers at the school, but one of the teachers was out sick that day. The core teacher we did visit had been teaching language arts for over 25 years experience. She said, “I was a reluctant participant at first, but that after just a few months, I wished that this technology had been available when I began teaching. What I could have accomplished as a teacher over the past twenty-five years would have been amazing.” She told us that her students were required to use Microsoft Word, Power Point, and the internet in many of their class assignments. She showed the results of their first large assignment of the new school year. It required each student to conduct internet research on some aspect of drama. This information then had to be incorporated into a written report and a Power Point presentation. She told us before we left, that “if someone had told me I would be using all this technology a year ago, I would have called them crazy.”

At the elementary school, we were met by the school principal (a 30 year veteran), who was quite excited by our visit. She actually conducted the tour of her school, taking us to see the school computer lab, the room where the school's network server was situated, and several classrooms. She said,

We are very excited the possibilities that technology could provide our school, and we are committed as a group to the integration of technology into the curriculum. We hope the funding to purchase more will be there in the future because I have plenty of other teachers here who would love to get workstations into their classrooms too.

Each classroom in the elementary school had at least one classroom computer, that had been purchased earlier with other LEARN, 8g and Title One monies. Two of the classrooms contained the newer multimedia workstations purchased with CBTF money.

We visited with one of the schools' core teachers. She explained that her fifth grade students were in the middle of science/math unit in weather that required them to track weather patterns – in this case a hurricane in the Carribean. They were using the computer and the internet to get the storm's daily coordinates. At the same time, each student was also conducting internet research about hurricanes that they had to use for written reports and presentations. She said,

I had one computer in my room before, but having the multimedia workstation has been really great. The whole school shares the digital camera and my LCD panel, which I am training the other teachers to use, along with Power Point and the internet. It would be great if we had more of the same setups. Do you know if we are going to get more money for technology this year? The other teachers here would love to have them in their rooms too.

### Summary

It was apparent that Lorraine Parish had made large strides in a short time. Their infrastructure had been completed largely cost free. There was strong support for technology from the central office, the school board, and the community. They had a district technology training center that was open to the whole community. They realized the importance of establishing a core of trained teachers at each school to serve as models and support for other teachers as more technology became available. The elementary school seemed a few steps ahead of the high school. Of course, the high school just received their first four computers in 1997-98, while the elementary school already had computers in every classroom.

The district faces some problems though. The loss of veteran teachers to other districts presents a large problem that will probably not go away until the district can find the funds necessary to raise teacher salaries to compete with its neighboring districts.

### Case Study Three - Bretagne Parish

Located in Southwest Louisiana, Bretagne Parish is one of the states growing suburban areas. Approximately half of the parish's 50,000 residents are employed in local industry and manufacturing. The parish has an average per capita income of \$21,000 and an unemployment rate below 7% (NELU, 1996). The school district receives approximately \$27 million from local taxes, and a

parish tax bond raised in 1997 provided the school district with another \$14 million dollars for educational technology.

The school district has 18 schools (12 elementary, four middle, and two high schools) that serve approximately 11,000 students. Bretagne's teachers are some of the highest paid teachers in the state, averaging over \$34,000 annually. The school district employs a large educational technology staff (34) headed by two coordinators – one who oversees the district's technical infrastructure, and another coordinator who oversees the integration, usage, and professional development of educational technologies.

The district intentionally chose to avoid participating in Louisiana NETDAY. Instead, the building of the district/school technical infrastructure was paid for with local tax dollars. John Buyer, the district technology coordinator in charge of infrastructure explained that

We felt apprehensive about the whole NETDAY thing or any other volunteer efforts and donated wiring. We wanted to make sure we knew what we were getting as far as materials and labor. Planning and conducting the design and implementation of our district/school infrastructure allowed us to control what happened, when it happened, where it happened, and how it happened. Ultimately, I think we have a higher quality infrastructure because we have kept the project in-house.

The district also chose not to wire every classroom in the district in one year. Instead, the wiring and installation of classroom internet connections coincides with the purchase and installation of classroom computers for specific grade levels each school year. The actual wiring of classrooms is completed by a permanent

full-time employee of the school district as opposed to an outside contractor. The district's network is maintained through a contract with Bell which provides the district with one full-time Bell technician.

During the 1996-97 and 1997-98 school years, local funds were used to purchase and install high-end multimedia computers in all the parish's second and third grade classrooms. Classroom-Based Technology Funds received during the 1997-98 school year were used to purchase 168 high-end multimedia computers for fourth grade classrooms. This purchase provided every fourth grade classroom in the parish with four high-end multimedia computers. Local funds provided every fourth grade classroom with a Hewlett Packard color printer for each of the four computers, as well as one large screen television, which was also connected to the classroom computers.

Every teacher in the parish has free home internet access provided for by the school district. All district employees have access to free computer training available at the Parish Technology Training Center, located in the School Board office complex. Since these training sessions are open to all personnel, training sessions often bring together personnel ranging from the superintendent to the custodial help.

### The Interview

The interview with Bretagne's two district technology coordinators took place in a conference room at the school board office. The coordinators asked to

be interviewed together because each had specific knowledge regarding varying aspects of the district's educational technology efforts that the other did not.

Both coordinators felt the Classroom-Based Technology Funds had been a plus for their district because "the extra money allowed our district to buy more computers than we had planned to this year." However, they both made it quite clear that their district was not dependent on state funds: "If the state fails to provide Classroom-Based Technology funding in the future, our district's technology push will continue as we originally planned because we have worked hard to create strong funding support at the local level. The state money is a nice extra, but we would be just fine without it."

Both coordinators felt that the creation of the Louisiana Center for Educational Technology was one of the state's best policies: "The LCET staff has been a tremendous asset to all the schools and districts." Both coordinators thought the LCET had provided districts with valuable information regarding the Federal Government's E-Rate Discounts, which could potentially save districts across the state millions of dollars. John Buyer said, "For the first time, Louisiana has a center through which all the state's technology coordinators can meet and interact." Susan Breaux said that "The LCET has been very helpful, providing us with information and professional development focused on the integration of technology and the curriculum."

In response to what changes they would like to see in the state's policies, they both expressed frustration over the Classroom-Based Technology grant

application and the red tape associated with the funding process. Susan said that

Last year, I put in over fifty hours completing the CBTF grant application. This year it was supposed to be simplified, but it's actually more complicated. I've already put in fifty hours and I'm not close to completing it. I talked to another district technology coordinator last week, who said that he had put in 80 hours completing the application. It's the most time-consuming grant application I have ever had to complete, and it doesn't have to be. So much of it is redundant, asking the applicant to repeat similar answers in various sections.

John said, "We were frustrated with the time line for the grant review process and the actual distribution of funds. We hope we receive the funds earlier this next year, so we make our purchases and get the machines into the classrooms sooner."

### School Visits

The district technology coordinator in charge of instruction took us to two schools in the parish – one elementary and one middle school. At the elementary school we were met by one of the district's school technology facilitators. School technology facilitators work in the schools helping teachers integrate technology into their daily teaching routines through integrated lesson planning, teaching, and evaluation. Each elementary school has a technology facilitator for one day per week.

The school technology facilitator explained that "the fourth grade teachers had only received their classroom computers just before school opened, so they are still in the process of getting acquainted with the machines and the software." We visited several fourth grade classrooms and one large computer lab (53 computers). Each fourth grade class we saw had four multimedia computers that



were each stationed on a multimedia cart, which also contained a high-end color printer.

While there were no students in the first fourth grade classroom we visited, the teacher was busy working on one of her new computers. After being introduced, she said, "I am just novice technology user and still feel a little nervous, but having a technology facilitator in the school for at least one day a week has been a tremendous help." She then showed us a math project her fourth graders had just completed with their new computers. She was incorporating every student's project into a Power Point presentation for their parents to view at "Back to School Night." The project required the fourth graders take their digital photograph and personal information based on their math lesson (measurement and weights) and insert it into a table they created. This project integrated math and writing with several computer tasks.

In another fourth grade class, students were using their new math textbook in conjunction with the publisher's interactive math web-site. This required students to navigate the web site and solved interactive math problems.

This school also had a computer assisted instruction lab that contained over 50 PC computers. Each lab was run by one full-time staff member. Students went to the lab once a week to learn basic keyboarding and computer skills, as well as receive individualized math and reading instruction. The district technology coordinator said that,

We believe that computer labs are an important part of our total educational technology plan. When students come to the lab, they receive individualized instruction that allows them to work at their own pace. The software allows us to monitor each student's progress and provide specific students help in areas they might be having difficulties.

### Summary

There was sense that the state's technology policies were less critical to Bretagne's educational technology efforts. This may, in part, be due to the district's larger educational technology budget, which affords it more staff, more training, and more hardware. Besides money though, the district embraced educational technology in the early part of the decade. Consequently, their experience level is significantly higher than many of the state's other districts. The district also works hard to make sure the community, its businesses, and the school personnel (teachers, administrators, and the school board) are educated, informed, and involved in the district's education technology initiative. Currently, equity of access for all its students is one of the school districts top priorities -- and the community knows this. The payoff for district's hard work is widespread support for educational technology from of the community and its businesses.

Students, teachers, principals, and central office staff all seemed truly supportive and excited about the introduction of the new computers and peripherals. At the same time, their exuberance was coupled with a serious commitment to integrate technology with teaching, learning, and evaluation. In

the end, the technology was being incorporated for one reason – to improve student outcomes.

## **CHAPTER SIX DISCUSSION**

### **Overview**

This study explored the first year impact of state technology policy on local district technology efforts. Four research questions were posited in this study:

- (1) How did district/school technology levels (the self-reported numbers of computers, printers, networks, funding, etc.) differ when comparing the 1996-97 school year and the 1997-98 school year – the year before and after implementation of state’s new technology policies?
- (2) To what degree did specific technology-related policies/measures exist at the district level during the 1996-97 and 1997-98 school years? Was there significant change between the 1996-97 and 1997-98 school years? Was there a significant difference in district responses in relation to district size (small, medium, or large), district type (rural, suburban, or urban), or district technology levels (average, above average, below average)?
- (3) What were the district perceptions of various state technology policies implemented in the 1997-98 school year? Was there a significant difference in district perceptions of state technology policies in relation to district size (small, medium, or large), district type (rural, suburban, or urban), or district technology levels (average, above average, below average)?

(4) How were districts affected by the implementation of the state's new technology policies in the 1997-98 school year?

### Limitations of the Study

As it is designed, the study was limited by several factors. Qualitative research by nature involves human interpretation, which means that case study methodology and analysis possesses certain limitations with regards to reliability and validity (Yin, 1994; Wolcott, 1990; Eisner & Peshkin, 1990; Clifford & Marcus, 1986). To reduce these limitations and provide more compelling evidence, a multiple case study design was employed (Yin, 1994; Herriott & Firestone, 1983). Reliability and validity were improved through data triangulation (interviews, observations, and visitations) and the use of thick description (Patton, 1990; Cicourel, 1975).

The quantitative data were all self-reported, which as (Borg and Gall, 1989) point out can be unreliable. Second, state educational technology funds were tied directly (by law) to district/school completion of the SETS instruments for 1996-97 and 1997-98, which included school identifiers. Third, the DERST instrument was designed and administered by the Governor's Office of Education, which might have lead districts to report what they thought the state wanted or needed to hear.

Finally, the districts in which case studies were to be conducted, were informed prior to the data collection that the primary researcher, who was

collecting data for a dissertation, was also employed by the Governor's Office of Education.

### Research Question One

Between the Spring of 1997 and the Spring of 1998, school reported *SETS* data suggests that public school technology levels for hardware increased significantly across the state, even in districts that previously had no technology plan or technology prior to 1997-98. The levels of available district technology funding, multimedia computers, network connected schools, local and wide area networks all rose substantially, as did the reported local awareness and support for educational technology.

### State Funding

Over 95% of the districts stated, when asked, that funding for hardware and training were the key two of the key factors underlying their district's technology successes during the 1997-98 school year.

State funding through the Classroom-Based Technology Fund provided Louisiana districts and school with an extra 37.2 million dollars allocated explicitly by law for the purchasing of hardware and software. Almost two thirds of the public school districts (61%) reported an increase in their technology budgets of 76% or more for the 1997-98 school year. One district coordinator's written statement regarding state funding encapsulated all the district comments:

Both the Classroom-Based Technology Fund and the Technology Literacy Challenge Fund have been important to the success of our technology efforts this year. Without the Classroom-Based Technology Fund we could not have purchased the equipment, and without the Technology Literacy Challenge Fund we would not have been able to provide much needed teacher training.

Another district coordinator wrote that “these funds for hardware and other equipment and staff development were the key to the successful implementation of our technology plan in the 1997-98 school year.” Data from the case studies revealed that state technology funding allowed a poor rural district with little in the way of local technology funding like Alsace Parish to establish a technical infrastructure based on a T-1 backbone. At the same time, state dollars also allowed a wealthier district like Bretagne to purchase four multimedia computers for every fourth grade classroom in the district.

Many districts also reported that the state requirements attached to CBTF funding by law helped local efforts. For example, one requirement was that the CBTF recipients show coordinated use of various funding sources, which many districts stated helped them leverage their funding for much greater results and benefit. Many districts also reported that another result of state funding for educational technology was that a few school boards finally sat up and addressed issues related to educational technology in their district: “State funds served as an impetus for our local board to contribute funds.” Many districts also stated that requiring technology plans at all school targeted for CBTF funds helped direct

both their schools and the district toward a more organized and systematic approach to the planning process.

### Research Question Two

Question two addressed the extent that specific technology-related policies and measures evaluated in Part One of the *DERST* instrument (questions 1-18) existed at the district level during the 1996-97 and 1997-98 school years, and if there was significant change between the 1996-97 and 1997-98 school years. Analysis of the reported data with paired-samples t-test (Borg and Gall, 1989) indicated statistically significant differences between the 1996-97 to 1997-98 school years ( $p \leq .001$ ) for all 18 questions. This would suggest that all 18 of the policy activities and measures increased significantly at the district level in the 1997-98 school year.

Results of the ANOVA showed significant differences in district responses by type for six of the eighteen (6/18) questions in Part One. These significant differences suggest that rural parishes lagged behind urban and suburban districts in several areas during the 1996-97 school year:

- district personnel who can support and maintain district/school technology infrastructure;
- local school board awareness regarding educational technologies;
- ongoing technology training for teachers;



- a significant number (50% ≤) of teachers effectively using technology with their students;
- increased classroom based technology as opposed to lab-based;
- opportunities for students to apply state-of -the-art technology to critical thinking and problem solving.

In comparison, the 1997-98 response data suggests that rural districts made up some ground. There was only a significant difference between rural and urban districts in three areas:

- district personnel who can support and maintain district/school technology infrastructure;
- opportunities for students to apply state-of -the-art technology to critical thinking and problem solving;
- increased classroom based technology as opposed to lab-based.

The case studies offer some insights into why these differences exist.

### Research Question Three

Descriptive statistics suggest that 17 of the state's 20 technology policies were beneficial or highly beneficial as measured in Part Two of the *DERST* instrument.

Analysis of variance, indicated no significant difference in the responses of districts grouped by district size (small, medium, or large), district type (rural, suburban, or urban), or district technology levels (average, above average, below

average) for any of the questions in Part Two of the *DERST* instrument. District responses across these sub-groups appeared homogenous for all twenty policy measured in Part Two of the *DERST* instrument.

The research of Fuhrman et.al (1990), shows that many districts are often pro-active rather than reactive as some earlier research had suggested. In fact, many districts actually respond positively to state reforms. In over half of the districts they studied, local districts took advantage of new state policies and the funds that generally accompanied them to support local priorities. In some cases, local leaders even used state policy as a lever to move their own local initiatives forward, so much so that local district initiatives actually influenced state policy decisions or were even actively influencing and responding to state policy:

many of the districts we observed busily making their own policies, engaging in networks with and borrowing from other local districts. Such districts do not merely adapt to state policy, they orchestrate and amplify policies around local priorities, whether or not any of the other conditions that would make those policies easy to implement exist. . . . (Fuhrman et. al in Odden, 1990, p. 217).

This might explain the overwhelming support Louisiana districts seemed to have for the state educational technology policies evaluated in the *DERST* instrument. Previous to 1997, many Louisiana school districts had been active lobbying for state support of educational technology. District personnel also provided state policy makers with input regarding future state educational policy at regional meetings held across the state in 1996. As a consequence, districts had a vested interest in many of the technology policy measures the state implemented in the

1997-98 school year, which might explain the lack of variation in district perception presented in McLaughlin (1991).

District dissatisfaction with state technology policy was limited to only two areas: the grant application and the grant funding time line. Only the grant application received a significant ( $\geq 50\%$ ) number of complaints, however, and those were not limited to rich or poor, small or large, urban or rural districts. All three district technology coordinators interviewed for the case studies thought the grant application was repetitive and time consuming.

#### Research Question Four

The reported quantitative data and data from the case studies suggest that state involvement in educational technology has had a positive impact on local district technology efforts during the 1997-98 school year. All the districts now have a district technology plan and a district Internet Acceptable Use Policy (AUP). All the districts have begun or completed construction of a local technology infrastructure. All of the districts now have local Internet access, and 57% of the districts even reported having direct Internet access as opposed to phone dial-up access. The state's student to multimedia computer ratio dropped significantly in 1997-98, while the number of districts with wide area networks rose significantly. For the first year, a significant number of districts (65%) reported that technology skills are now addressed as part of the every teacher's yearly staff development.

By state law, Classroom-Based Technology Funds (CBTF) could only be used to purchase hardware (e.g., computers, peripherals, wiring, servers) and software. Although the districts were limited to purchasing only, hardware, software, and wiring, how districts targeted their money appeared to be different for each parish. While each district purchased hardware and software with their Classroom-Based Technology Funds, the case studies suggest that variation in implementation was the norm, not the exception. Each district made spending decisions based upon local need. Alsace Parish created an infrastructure because they did not have one and felt they would never have the opportunity to do so again. Lorraine Parish purchased 16 multimedia workstations for their eight schools because of local political considerations and the fact that they were able to get their infrastructure built free. Bretagne Parish was able to purchase 168 multimedia computers and printers for all of their fourth grade classrooms because CBTF were largely a bonus for their district not a necessity. Each district focused CBTF funds for different reasons, largely determined by local need and design.

### District Context

District variation can be attributed to several factors evident in the case studies that can be grouped together under the heading of district context. District context encompasses factors such as local funding for educational technology, administrative support for educational technology, district and school level technical support, teacher training and support for educational technology,

parental support for educational technology, and the parish economy and tax base district and school technical support, parish economy, and local politics. The research of Fuhrman et.al (1990), Elmore (1993) and McLaughlin (1991) suggest that district context is a critical consideration in education policy implementation. It cannot be overlooked for “appears not only important but paramount” (Fuhrman et. al in Odden, 1990, p. 217). Analysis of the case study data seems to support the critical nature of district context.

It was apparent from the case studies that district context was critical part of the technology implementation formula in Alsace, Bretagne, and Lorraine school districts. Alsace and Lorraine had district technology staffs of one, and both district technology coordinators were also Title I coordinators. On the other hand, the Bretagne school district had a technology staff of 34. While the Alsace school district received under \$300,000 in local tax revenue, the Bretagne School district received \$24 million in local tax revenue. Classroom-Based Technology Funding (approximately \$41 per child) was the only variable these three districts shared equally.

These differences were also apparent at the school and classroom level. Each school in Bretagne had resources in the form of hardware, trained personnel, and leadership that would probably be unimaginable even at the district level in a poor rural district like Alsace.

What does all this mean for the state technology policy and state policy makers? Technology equity is one of the newest considerations for state and federal policy makers across the country. Richard Coley, a policy analyst at *Education Testing Services*, told Education Week in 1997 that “The most needy students are getting the least access to technology. . . . There is a perception that in terms of technology, poorer schools weren’t doing too badly; that because of Title I poorer schools look similar to other schools. It’s not the case” (May 21,1997). Continued state support for educational technology would seem to be a critical necessity for many of the state’s local school districts. Louisiana, as well as other states, may even need to consider the weighting of current technology funding formulas in order to avoid the technology inequities school districts in Florida encountered in the last few years.

#### Summary and Recommendations

This study was exploratory in nature. It examined the first-year impact of state technology policy on local district technology efforts. Technology levels, district reported perceptions of state policy, and case studies of three districts were used to examine this impact. Results suggest that the first-year impact of the state’s technology policies were highly beneficial to local district technology efforts.

These finding are in no way conclusive. Further research regarding district perceptions of policy and the role they play in the implementation process needs

to be conducted through what McLaughlin (1991) calls a multi-dimensional approach to policy research. The role district context in policy implementation certainly warrants further research in Louisiana and beyond.

Based on the data and findings in this study, I would strongly urge the State Legislature to continue their funding for educational technology at the district and school level. While the funding received in 1997-98 (37.2 million) is good beginning, it is only that. State funding and involvement in educational technology may be the most critical component that will determine the success of Louisiana's current educational technology drive. Without state help, many Louisiana public school districts will not be able to keep pace with the high cost and high demands educational technology places on schools and local districts.

At the same time, I would urge the Legislature to carefully consider making state funding for educational technology part of the state's funding formula (MFP). This would serve two purposes. First, it would provide districts and schools with secure funding for educational technologies. Second, since the MFP utilizes a weighted per pupil formula to calculate educational funding amounts, state policy makers could pro-actively ensure equity in educational technology spending for all Louisiana students.

## REFERENCES

*A Nation Prepared: Teachers for the 21<sup>st</sup> Century, Tomorrow's Teachers, and a Time for Results: The Governor's Report on Education.* (1986). National Governor's Association.

Anderson, L. S., & Perry, J. F. (1998). *Technology planning: A recipe for success*. MS: National Center for Technology Planning.

Anson R. J. (1994). (Ed.). *Systemic reform: Perspectives on personalizing education*. Washington D.C.: U.S. Department of Education.

Barro, S. M. (1978). Federal education goals and policy instruments: An assessment of the 'strings' attached to categorical grants in education. In Michael Timpane (Ed.), *The Federal interest in financing schools*. Santa Monica, CA: Rand.

Barro, S. M. (1974). *The impact of inter-governmental aid on public school spending*. Unpublished doctoral dissertation. Stanford University.

Beare, H., & Boyd, W. L. (Eds.) *Restructuring schools: An international perspective on the movement to transform the control and performance of schools*. Berkeley: McCutchan.

Becker, H. J. (1993). A truly empowering technology-rich education – How much will it cost? *Educational IRM Quarterly*, 3(1), 31-35.

Becker, H. J. (1994). Analysis and trends of school use of new information technologies. Irvine, CA: University of California, Irvine, Department of Education.

Bell, Julie. (1998). National Council of State Legislators.

Berman, P. (1981). Toward an implementation paradigm. In R. Lehming & M. Kane (Eds.), *Improving schools*. Beverly Hills, CA: Sage.

Berman, P. (1978). "The study of macro- and micro-implementation." *Public Policy*, 26(2), 157-184.

Briggs, C. L. (1986). *Learning how to ask questions*. New York: Cambridge University Press.



Bitter, G. G., Camuse, R.A., & Durbin, V. L. (1996). *Using the microcomputer in the classroom*. (3<sup>rd</sup> ed.). Boston: Allyn & Bacon.

Bogdan, R., & Biklen, S. (1982). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn & Bacon.

Borg, W. R., & Gall, M. D. (1989). *Educational research: An introduction*. New York: Longman.

Bowers, C. A. (1988). *The cultural dimension of education computing*. New York: Teachers College Press.

Boyd, (1990). Balancing control and autonomy in school reform: The politics of "perestroika." In J. Murphy (Ed.), *The reform of American public education in the 1980s: Perspectives and cases*. Berkeley: McCutchan.

Boyd, W. L. (1987). The politics of education productivity. In D. Monk & J. Underwood, (Eds), *Distributing educational resources within nations, states, school districts, and schools*. Cambridge, MA: Ballinger.

Boyd, W. L. (1987, Summer). Public education's last hurrah? Schizophrenia, amnesia, and ignorance in school politics. *Educational Evaluation and Policy Analysis* 9(2), 85-100.

Boyer, E. L. (1983). *High school: A report on secondary education in America*. New York: Harper and Row.

Calfee, R. (1991). What schools can do to improve literacy instruction. In B. Means, C. Chelemer, & M.S. Knapp (Eds.), *Teaching advanced skills to at-risk students: Views from research and practice*. San Francisco: Jossey-Bass.

Carnegie Forum on Education and the Economy. *A nation prepared: Teachers for the 21<sup>st</sup> century*, The Report on the Task Force on Teaching as a Profession. New York: Carnegie Forum on Education and the Economy.

*Council of Chief State School Officers Recommendations for the National Education Summit, 1997*. Washington D.C.: Council of Chief State School Officers.

Chance, W. (1986). ". . . the best of educations" *Reforming America's Public Schools in the 1980s*. Washington D.C.: McCarthur Foundation

- Chin, S.S., & Hortin, J. A. (1993-94). Teachers' perceptions of instructional technology and staff development. *Journal of Educational Technology Systems*, 22(2), 83-98.
- Chubb, M. & Moe, T. (1991). *Politics, markets, and America's schools*. Washington D.C.: Brookings Institution.
- Chubb, M. (1988). Why reforms won't succeed? *Policy Inquiry*,
- Cicourel, A. V., & Kitsuse, J. I. (1963). *The educational decision makers*. Indianapolis: Bobbs-Merrill.
- Clark, D. L., & Astuto, T. F. (1994). Redirecting reform. *Phi Delta Kappan*, 752(7), 513-521.
- Clune, W. (1987). *The implementation and effects of high school graduation requirements: First steps toward curricular reform*. New Brunswick, NJ: Rutgers University, Center for Policy Research in Education (CPRE).
- Cohen, D., & Spillane, J. P. (1993). Policy and practice: The relations between governance and instruction. In S. H. Furhmann (Ed.), *Designing Coherent Education Policy – Improving the System*. San Francisco: Jossey Bass.
- Cohen, D. (1988). Educational technology and School organization. In R. S. Nickerson & P. P. Zodhiates (Eds.), *Technology in education: Looking toward 2020* (pp. 231-264). Hillsdale, NJ: Erlbaum.
- Cohen, D. (1987). "Educational technology, policy, and practice." *Educational Evaluation and Policy Analysis*, 9, 153-170.
- Cohen, D. (1982). Policy and organization: The impact of state and federal education policy on school governance. *Harvard Educational Review*, 52(4), 474-499.
- Collins, A. (1990). The role of computer technology in restructuring schools, In K. Sheingold & M.S. Tucker (Eds.), *Restructuring for learning with technology*. New York: Center for Technology in Education, Bank Street College of Education; and Rochester, NY: National Center on Education and the Economy.
- Cradler, J. (1995). *Implementing Technology in Education: Recent Findings from Research and Evaluation Studies*. San Francisco: Far West Education Laboratory.

Crandall, D., & Associates. (1982). *A study of dissemination efforts supporting school improvement*, Volumes 1-10. Andover, MA.

Cuban, L. (1993). "The lure of curricular reform and its pitiful history." *Phi Delta Kappan*, 75(2), 182-185.

Cuban, L. (1992). Why some reforms last: The case of the Kindergarten. *American Journal of Education*, February, p. 167-194.

Cuban, L. (1990). Reforming again and again and again. *Educational Researcher*, 19(1), pp. 3-13.

Cuban, L. (1988). "A fundamental puzzle of school reform." *Phi Delta Kappan*, 66(3), 213-215.

Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press.

Cuban, L. (1984). *How teachers taught*. New York: Longman.

Darling-Hammond, L. & Berry, B. (1988). *The evolution of teacher policy*. Santa Monica: The Rand Corporation.

Darling-Hammond, L. (1993). Reforming the school reform agenda. *Phi Delta Kappan*, 74( ), 752-762

Darling-Hammond, L. (1988, Winter). Accountability and professionalism. *American Educator*, 8-13, 38-40.

Darling-Hammond, L. (1987). Schools for tomorrow's teachers. *Teachers College Record*, 88(3), 354-358.

David, J. L. (1991). Restructuring and technology: Partners in change. *Phi Delta Kappan*, 73(1), 37-40; 78-82.

David, J. L., & Shields, P. M. (1991). *From effective schools to restructuring: A literature review*. Menlo Park, CA: SRI International.

Dawson, J. A. (1978). *Validity in qualitative inquiry*. Paper presented at Annual Meeting of American Educational Research Association, San Francisco.

Denzin, N. K. (1994). The art and politics of interpretation. In Denzin, N. K. & Lincoln, Y. S. *Handbook of qualitative research*. Thousand Oaks, CA: Sage.

Denzin, N. K. (1970). *The research act: A theoretical introduction to sociological methods*. New York: Aldine.

Drew, C. J. & Hardman, M.L. (1985). *Designing and conducting behavioral research*. Elmsfold, NY: Pergamon.

*Digest of Education Statistics*. (1997). Washington D.C.: U.S. Department of Education, Office of Educational Research and Improvement

Dodge, B.J. (1993). School-university partnerships and educational technology. *Eric Digest*. New York: Eric Clearinghouse in Information and Technology.

Dwyer, D. (1994). Apple classrooms of tomorrow: What we've learned. *Education Leadership*, April.

Dyrli, O. E., & Kinnaman, D. E. (1994). Moving from successful classrooms to successful schools. *Technology and Learning*, 14(6), 46-54.

Dyrli, O. E., & Kinnaman, D. E. (1994). District wide technology planning: The key to long-term success. *Technology and Learning*, 14(7), 50-56.

Education Commission of States. (1997). *Technology Component of State Standards: a Snapshot*. ECS Information Clearinghouse. Denver: Education Commission of the States.

Education Commission of States. (1983). *Action for excellence*. Denver: Education Commission of the States.

Elmore, R. F., & McLaughlin, M. (1988). *Steady work: Policy, practice, and the reform of American education*. Santa Monica, CA: Rand.

Elmore, R. F. (1979-1980). Backward mapping: Implementation research and policy decisions. *Political Science Quarterly*, 94, 601-616.

Fink, A. (1995a). *How to report on surveys*. Thousand Oaks: Sage Publications.

Fink, A. (1995b). *How to analyze survey data*. Thousand Oaks: Sage Publications.

Fullan, M. (1994). Coordinating top-down and bottom-up strategies for educational reform. In R. J. Anson (Ed.), *Systemic reform: Perspectives on personalizing education*. Washington D.C.: U.S. Department of Education.

Fullan, M., & Miles B. (1992). Getting reform right: What works and what doesn't. *Phi Delta Kappan*, 73(10), 745-752.

Fullan, M.G. (1990). Staff development, innovation, and institutional development. In B. Joyce (Ed.), *Changing school culture through staff development* (1990 Yearbook of the Association for Supervision and Curriculum Development, pp. 3-25). Alexandria, VA: Association for Supervision and Curriculum Development.

Fullan, M. (1982). *The meaning of educational change*. New York: Teachers College Press.

Furhmann, S., Clune, W., & Elmore, R. F. (1990). Research on education reform: Lessons on the implementation of policy. In A.R. Odden, (Ed.), *Education Policy Implementation*, New York: State University of New York Press.

*Getting America's Students Ready for the 21st Century; Meeting the Technology Literacy Challenge, A Report to the Nation on Technology and Education*. (1996). U. S. Department of Education.

Goodlad, (1984). *A place called school*. New York: McGraw Hill.

Gramlich, E. M. (1981). *Benefit-cost analysis of government programs*. Englewood Cliffs: NJ: Prentice-Hall.

Gramlich, E. M. (1977). *The New York City fiscal crisis: What happened and what is to be done?* Washington D.C.: Brookings Institution.

Hall, G. E., & Hord, S. M. (1987). *Change in schools: Facilitating the process*. New York: State University of New York Press.

Hawkins, R. L. (1994). Teaching teachers to teach with technology: Do's and don'ts. *The Computing Teacher*, 8, 16-17.

Herman, J. L. (1994). Evaluating the effects of technology in school reform. In B. Means (Ed.), *Technology and education reform: The reality behind the promise*, pp.133-167. San Francisco: Jossey Bass.

Inequities in access to technology documented. *Education Week*, May 21. 1997.

Ingram, H., & Mann, D. (1980). *Why policies succeed or fail*. Beverly Hills, CA: Sage.

Kirst, M. (1990). *Public sector choice in California*. Berkeley, CA: Policy Analysis for California Education.

Kirst, M. (1989). *Conditions of education in California*. Berkeley, CA: Policy Analysis for California Education.

Kirst, M., & Meister, G. R. (1985). Turbulence in American secondary schools: What reforms last? *Curriculum Inquiry*, 15, 169-185.

Kirst, M. (1988). Recent state education reform in the United States: Looking backward and forward. *Educational Administration Quarterly*, 2(5), 17-34.

James, T., & Tyack, D. (1983). Learning from past efforts to reform the high school. *Phi Delta Kappan*, 64(6), 400-406.

Jones, S. (1993). *The key elements of effective state planning for educational technology*. Available at [http://www.sreb.org/quicksearch/Tech/Stateplanning/state\\_planning.html](http://www.sreb.org/quicksearch/Tech/Stateplanning/state_planning.html). Atlanta: Souther Regional Education Board.

Lawton, M. (1997). Computes have little use without teacher training, study says. *Education Week*, July 9, [On-Line]. Available: <http://www.edweek.org/htbin/fastweb?getdoc+view4+ew1997+1215+8+wAAA+%26%28technology%29%26AND%26%28technology%29%3AKEYWORDS%26OR%26%28technology%29>.

Levin, H. M., & Meister, G. R. (1985). *Educational technology and computers: Promises, promises, always promises*. (Project Report No. 85-A13) Stanford, CA: Stanford University, Institute for Research on Educational Finance and Governance.

Levin, H. M. (1988). Cost effectiveness and educational policy. *Education evaluation and policy analysis*, 19(1), 51-69.

Lieberman, A., & Miller, L. (Eds.). (1991). *Staff development for education in '90s: The new demands, new realities, new perspectives*. New York: Teachers College Press.

Lieberman, A. (1988). *Building a professional culture in schools*. (Ed.) New York: Teachers College Press.

Lieberman, A. (1986). *Rethinking school improvement: Research, craft, and concept*. (Ed.). New York: Teachers College Press.

Lieberman, A., & Miller, L. (1984). *Teachers, their world and their work: Implications for school improvement*. Alexandria, Va.: Association of Curriculum Development.

Lindquist, & Mauriel, (1989). School based management: Doomed for failure? *Education and Urban Society*, 21(4), 403-416.

Litwin, M. S. (1995). *How to measure survey and reliability and validity*. Thousand Oaks: Sage Publications.

Lockheed, M.E., & Mandinach, E. B. (1986). Trends in educational computing: Decreasing interest and the changing focus of instruction. *Educational Researcher*, 15(4), 21-26.

Lortie, D. (1975). *School teacher*. Chicago: University of Chicago Press.

*Louisiana Goals 2000 Annual Report* (1997). Baton Rouge: Louisiana State Department of Education.

Louisiana State Educational Technology Report (1997). *Louisiana Project EdTech Survey*. Denver: Qualitative Education Data Incorporated.

Louisiana State Educational Technology Report (1998). *Louisiana Project EdTech Survey*. Denver: Qualitative Education Data Incorporated.

Lunenburg, F. C. (1992). The current educational reform movement – History, progress to date, and the future. *Education and Urban Society*, 25(1), 3-17.

*Making Technology Happen: Best practices and policies from exemplary K-12 schools*. (1997). Research Triangle Park, North Carolina: Southern Technology Council.

Market Data Retrieval. (1993). *Education and Technology 1993: A survey of the K-12 market*. Shelton, CT: Market Data Retrieval.

McDonnell, L. M., and Elmore, R. F. (1991). Getting the job done: Alternative policy instruments. In A.R. Odden, (Ed.), *Education Policy Implementation*, New York: State University of New York Press.

McKean, R. N. (1980). Enforcement costs in environmental and safety regulation. *Policy Analysis*, 6(2), 269-287.

McLaughlin, M. (1991). Learning from experience: Lessons from policy implementation. In A. R. Odden, (Ed.), *Education Policy Implementation*, New York: State University of New York Press.

McLaughlin, M. (1991). The rand change agent study: Ten years later. In A.R. Odden, (Ed.), *Education Policy Implementation*, New York: State University of New York Press.

McLaughlin, M. W. (1987). Learning from experience: Lessons from policy implementation. *Educational Evaluation and Policy Analysis*, 9(2), 171-178.

McLaughlin, M. W., and Marsh, D. D. (1978). Staff development and school change. *Teacher's College Record*, 80(1), 69-94.

Means, B., & Olson, K. (1994). The link between technology and authentic learning. *Educational Leadership*, 51(7), 15-18.

Means, B. (Ed.), *Technology and education reform: The reality behind the promise*. San Francisco: Jossey Bass.

Means, B., Blando, J., Olson, K., Middleton, T., Morocco, C. C., Remz, A. R., & Zorfass, J. (1993). *Using technology to support education reform*. Washington, DC: U.S. Department of Education, Office of Research.

Meister, G. R. (1984). *Successful integration of microcomputers in an elementary school*. Stanford, CA: Institute for Research on Educational Finance and Governance, Stanford University.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis*. Thousand Oaks, California: Sage Publications.



Monk, D., & Underwood, J. (1987). *Distributing educational resources within nations, states, school districts, and schools*. Cambridge, MA: Ballinger.

Muncey, D. E., & McQuillan, P. J. (1992). Findings from the field: What when schools restructure? A five-year study of eight essential schools. *Coalition of Essential Schools Publications Research*, September, No. 3.

Murphy, J. (1991). *Restructuring Schools: Capturing and assessing the phenomena*. New York: Teachers College Press.

Murphy, J. (1990). *The reform of America public education in the 1980's: Perspective and cases*. (Ed.). Berkeley, CA: McCutchan.

National Commission on Excellence in Education. *A nation at risk: The imperative for educational reform*. (1983). Washington, DC: U.S. Printing Office.

National Commission on Excellence in teacher education. (1985). *A call for change in teacher education*. Washington D.C.: American Association of Colleges for Teacher Education.

National Governor's Association. (1987). *Results in education*. Washington D.C.: National Governor's Association.

National Governor's Association. (1986). *Time for results*. Washington D.C.: National Governor's Association.

Newman, D. (1990). Opportunities for research on the organizational impact of school computers. *Educational Researcher*, 19(3), 8-13.

Noble, D. D. (1996). The overselling of educational technology. *Education Leadership*, November, 18-23.

Nyberg, D. A. (1990). Power, empowerment, and educational authority. In S. L. Jacobson, & J. A. Conway (Eds.), *Education leadership in an age of reform*. New York: Longman Press.

Oakes, J., & Schneider, M. (1984, November). Computers and schools: Another case of "...The more they stay the same"? *Educational Leadership*, pp.73-79.

O'Connor, B. (1991, October). *Planning for the technology rich learning environments of the future* (Draft; prepared for the Council of Chief State School

Officers Technology Leadership Conference, Dallas TX). Sacramento, CA: California State University, Institute for the Study of Politics and Media.

Odden, A. (1991). New patterns of education policy implementation and challenges for the 1990s. In A. Odden (Ed.), *Education Policy Implementation*, (pp. 297-327). Albany, New York: State University of New York Press.

Odden, A. (1990). Class size and student achievement: Research-Based policy alternatives. *Educational Evaluation and Policy Analysis*, 12(2), 213-227.

Odden, A., & Odden, E. (1984). Education reform, school improvement, and state policy. *Educational Leadership*, 42(2), 13-19.

Office of Technology Assessment. *Teachers and technology: Making the connection*. OTA-EHR-616. Washington D.C.: U.S. Government Printing Office.

Olson, L. (1987). An overview of the Holmes Group. *Phi Delta Kappan*, 69(8), 619-21.

Orlick, D. (1989). Education reforms: Mistakes, misconceptions, miscues. *Phi Delta Kappan*, 70(7), 512-517.

Patton, M. Q. (1980). *Qualitative evaluations methods*. Newbury Park, CA: Sage.

Patton, M. Q. (1990). *Qualitative evaluation and research methods*. Newbury Park, CA: Sage.

Piele, P. K. (1989). The politics of technology utilization. In D. E. Mitchell & M. E. Goertz (Eds.), *Educational politics for the new century: The twentieth anniversary yearbook of the Politics of Education Association* (pp. 93-106). London: Falmer Press.

Plank, D. N. (1987). Why school reform doesn't change schools: Political and organizational perspectives. In A. Lewis, *Restructuring America's schools*. Arlington, VA: American Association of School Administrators.

Ravitch, D. (1985). *The schools we deserve*. New York: Basic Books.

Rosenholtz, S. J. (1989). *Teachers' workplace: The social organization of schools*. White Plains, NY: Longman.

Rosenholtz, S. J. (1985). *Needed resolves for educational research*. Washington DC: National Center for Education Statistics.

Sarason, S.B. (1990). *The predictable failure of school reform: Can we change course before it's too late*. San Francisco: Jossey-Bass.

Schlechty, P.C. (1990). *Schools for the 21<sup>st</sup> Century: Leadership imperatives for educational reform*. San Francisco: Jossey-Bass.

*Schools facilities: America's schools not designed or equipped for 21<sup>st</sup> century*. U.S. General Accounting Office Report to Congressional Requesters (GAO/HEHS-95-95).

Schools rush to get wired without a plan. *USA Today*, October 8, 1997.

Segal, H. P. (1996). The american ideology of technological process: Historical perspectives. In S.T. Kerr, *Technology and the Future of Schooling: Ninety-fifth Yearbook of the National Society for the Study of Education, Part II*. Chicago: University of Chicago Press.

Sergiovanni, T. J., Burlingame, M., Coombs, F. S., & Thurston, P. W. (1987). *Educational governance and administration* (2<sup>nd</sup> ed.) Englewood Cliffs, NJ: Prentice-Hall.

Sheingold, K. (1990, December). Restructuring for learning with technology: The potential for synergy. *Restructuring for Learning with Technology*, pp. 9-27.

Sheingold, K. (1991b, October). *Toward an alternative teaching environment*. (Draft for Technology Leadership Conference, Council of Chief State School Officers, Dallas).

Sheingold, K., & Hadley, M. (1990). *Accomplished teachers: Integrating computers into classroom practice*. New York: Bank Street College of Education, Center for Technology in Education.

Sheingold, K., & Tucker, M.S. (Eds.). (1990, December). *Restructuring for learning with technology*. New York: Bank Street College of Education, Center for Technology in Education; and Rochester, NY: National Center on Education and the Economy.

Siven-Kachala, J., & Bialo, E. (1994). *Report on the effectiveness of technology in schools, 1990-94*. Washington, DC: Software Publishers Association.

*SREB Education Benchmarks*. (1996). Atlanta: Southern Regional Education Board.

Sizer, T. R. (1992). *Horace's Compromise: The dilemma of the american high school*. New York: Houghton Mifflin.

Starr, P. (1996). Computing our way to educational reform. *The American Spectator*, July-August, 50-59.

Stigler, G. J. (1971). Theory of economic regulation. *Bell Journal of economics and management science*, 2, 1-21.

Sutton, R. E. (1990). Equity and computers in the schools: A decade of research. *Review of Educational Research*, 61(4) 475-503.

Taylor, D. L. & Bogotch, I. E. (1994). School-level effects of teachers' participation in decision making. *Education evaluation and policy analysis*, 16(3), 302-319.

Technology counts: School reform in the information age. (1997). *Education Week*, 17(11).

*Technology and Education Reform Project*. (1995). U.S. Department of Education, Office of Research.

*Teachers and Technology: Making the Connection*. (1995). U.S. Department of Education, Office of Technology Assistance.

Timar, & Kirp (1989). Education and reform in the 1980s: Lessons from the states. *Phi Delta Kappan*, 70(7) 504-511.

*Tomorrow's teachers: A report of the Holmes Group*. (1986). East Lansing, Michigan: The Holmes Group.

Trotter, A. (1997). Taking Technology's Measure. In *Technology Counts*, *Education Week*, 17(11), p. 6-11.

Tyack, D. (1991). Public school reform: Policy talk and institutional practice. *American Journal of Education*, November, pp 1-19. Chicago: University of Chicago Press.

Urbatsch, L. (1998). 8(g) *Allocation Data*. Baton Rouge: Board of Elementary and Secondary Education.

White, K. A. (1997a). School technology spending on the rise, survey predicts. *Education Week*, September 3, [On-Line]. Available at: <http://www.edweek.org/htbin/fastweb?getdoc+view4+ew1997+1389+6+wAAA+%26%28technology%29%26AND%26%28technology%29%3AKEYWORDS%26OR%26%28technology%29>

White, K. A. (1997b). School technology captures public's fascination, states' dollars. *Education Week*, July 9 [On-line]. Available: <http://www.edweek.org/htbin/fastweb?getdoc+view4+ew1997+1267+7+wAAA+%26%28technology%29%26AND%26%28technology%29%3AKEYWORDS%26OR%26%28technology%29>.

Wise, A. (1977). Why education policies fail: The hyperrationalization hypothesis. *Curriculum Studies*, 1( ), 48.

Wiske, M.S., & Houde, R. (1988). *From recitation to construction: Teachers change with new technologies* (Technical Report TR88-28). Cambridge, MA: Harvard Graduate School of Education, Educational Technology Center.

Wohlstetter, P., Smyer, R., & Mohrman, S. A. (1994). New boundaries for school-based management: The high involvement model. *Educational Evaluation and Policy Analysis*, 16 (3), 268-286.

Yin, R. K. (1994). *Case study research: Design and methods*. Thousand Oaks: Sage Publications.

Yin, R. K. (1993). *Applications of case study research*. Newbury Park, CA: Sage.

**APPENDIX A**  
**1996-97 *SETS* INSTRUMENT**

# STATE OF LOUISIANA SCHOOL LEVEL TECHNOLOGY SURVEY

## INTRODUCTION

*The enclosed survey has been developed to establish baseline data pertaining to the current status of technology in public and non-public schools in Louisiana.*

*ALL questions must be answered in this survey. If you are unsure of the meaning of a question, please contact the following individuals, and they will assist you with the questions:*

Logan McDaniel  
Carol Whelan  
Jeanne M. Burns  
Sue Bosier

Louisiana Department of Education 504-342-4052  
Louisiana Department of Education 504-342-3967  
Office of the Governor 504-342-0162  
Quality Education Data, Inc. 1-800-525-5811 (137)

lmcDaniel@mail.doe.state.la.us  
cwhelan@usl.edu  
jburns@selu.edu  
sbosier@qeddata.com

*Please respond based upon what is available at your school as of March 1, 1997. Once completed, return the survey by mail or fax by April 25, 1997. [NOTE: QED's toll free fax number (1-800-621-6089) may be used to return the survey, or the survey may be refolded and sent with the business reply on the outside (postage has been prepaid).] We ask that you also send a xeroxed copy of the completed survey to your district superintendent for his/her records.*

## SCHOOL INFORMATION

The last page of this survey contains the name and address of your school; therefore, it is essential that *all four pages* of the survey be returned to QED. Please provide us with the additional information that we have listed below.

School's Fax Number:	
E-Mail Address for School (if one exists):	
School's URL (Home Page) Address (if one exists):	
School's Technology Contact Person's Name:	
E-mail address of School's Technology Contact Person:	
Librarian/Media Specialist's Name	

## PLANNING AND SUPPORT

- ☐ YES ☐ NO 1. Do you have a plan for technology that is linked to your *individual school's* improvement plan? (If yes, please respond to questions 1a & 1b.)
- a. What is the most recent month & year in which your *school's* plan for technology was developed/reviewed?
- ☐ YES ☐ NO b. Is the planning and implementation of your technology initiative linked to your *district* improvement plan?
- ☐ YES ☐ NO 2. Does your school have a school and/or district person who is responsible for providing teachers with support and assistance in integrating technology into the curriculum? [If yes, indicate the type(s).]
- ☐ School-based Person(s)      ☐ District Person(s)      ☐ Both
- ☐ YES ☐ NO 3. Does your school have a school and/or district person who helps to maintain and support hardware and software in your school? [If yes, indicate the type(s).]
- ☐ School-based Person(s)      ☐ District Person(s)      ☐ Both
4. Please estimate the *percentage* of teachers in your school at each skill level in the use of technology in instruction:
- |                              |                                  |
|------------------------------|----------------------------------|
| _____ % No Experience        | _____ % Intermediate Skill Level |
| _____ % Beginner Skill Level | _____ % Advanced Skill Level     |

**CONNECTIVITY AND USE**

- ☐ YES ☐ NO 5. Does your school have access to the Internet? (If yes, indicate the type of link and lines.)  
☐ Direct link ☐ Dial up link Number of dial-up lines in the school? \_\_\_\_\_
- ☐ YES ☐ NO 6. Do students and/or staff have access to a Web browser (Netscape, Explorer, etc.)? (If yes, indicate who has access:) ☐ Students ☐ Staff ☐ Students & Staff
7. Estimate the *percentage* of teachers who use computers at least 50 minutes per week to support teaching and learning: \_\_\_\_\_%
8. Estimate the *percentage* of students who use computers as part of their instructional program at least 50 minutes per week: \_\_\_\_\_%
9. Estimate the *percentage* of teachers/staff at your school who have Internet E-mail addresses: \_\_\_\_\_%
- ☐ YES ☐ NO 10. Do you currently have computers in your classrooms connected to computers in other classrooms, Labs, or the Media Center(s) at your school through a LAN (local area network)? (If yes, please respond to questions 10a - 10c.)
- a. How many computers are connected for instructional use? \_\_\_\_\_
- b. How many computers are connected for administrative use? \_\_\_\_\_
- c. How many LAN (local area network) servers are currently installed? \_\_\_\_\_
- ☐ YES ☐ NO 11. Is your school connected to another school or schools through a WAN (wide area network)? (If yes, please respond to questions 11a - 11c.)
- a. Is the WAN (wide area network) for instructional use? ☐ YES ☐ NO
- b. Is the WAN (wide area network) for administrative use? ☐ YES ☐ NO
- c. Is the WAN (wide area network) for student use? ☐ YES ☐ NO
- ☐ YES ☐ NO 12. What *percentage* of students in your school participate in classes from remote sites via:  
 \_\_\_\_\_ Desktop technologies \_\_\_\_\_ Compressed 2-way video \_\_\_\_\_ Satellite  
 \_\_\_\_\_ Interactive TV \_\_\_\_\_ Cable TV (e.g., CNN)
- ☐ YES ☐ NO 13. Does your school make computers available to parents and/or community members? (If yes, please indicate the type(s) of use.) ☐ General use ☐ Job training ☐ Both

**FINANCIAL**

- ☐ YES ☐ NO 14. Have you and/or your staff created a school budget for technology? (If yes, please respond to 14a-14c.)
- a. What is your individual school's technology budget for FY96-97? \$ \_\_\_\_\_
- b. What is your individual school's projected technology budget for FY97-98? ☐ Not yet determined. \$ \_\_\_\_\_
- c. What percentage of the FY96-97 technology budget is being devoted toward?
- |                        |                                       |
|------------------------|---------------------------------------|
| Hardware: _____%       | Instructional Software: _____%        |
| Staff Training: _____% | Assistive/Adaptive Technology: _____% |
| TV/Video: _____%       | Support and Maintenance: _____%       |

**HARDWARE - PERIPHERALS**

15. Report the *number* of each of the following peripherals in your school:

TYPE	#	TYPE	#	TYPE	#
a. Printers		e. CD ROM stand alone		i. TV monitors	
b. Scanners/digitizers		f. Graphing calculators		j. Laser disc players	
c. Digital cameras		g. Video cameras		k. VCR units	
d. CD ROM networked		h. Computer projection devices		l. Assistive/adaptive devices	



## HARDWARE - COMPUTERS

16. Please indicate the *number of computers* that are *currently being used* in your school that fit each of the following categories. (NOTE: Please count each computer as either being used for "Student/Instructional Purposes" or "Administrative/Other Purposes". Do not count one computer as both instructional and administrative.)

Types of Computers	Number of Computers Used for Student/Instructional Purposes	Number of Computers Used for Administrative/Other Purposes	Number of Computers that are Multimedia Equipped (e.g., Computer has a CD-ROM, Video Graphics & Sound Card)
<b>APPLE/MAC COMPUTERS</b>			
A. Apple II/IIc/IIe/IIgs or earlier			
B. Mac LCII, LC, or earlier Mac			
C. Mac LCIII (68030)			
D. Mac Quadra/Centris (68040)			
E. Mac Power PC			
F. Mac Powerbook			
<b>PC COMPATIBLE COMPUTERS</b>			
G. 286 or earlier			
H. 386			
I. 486			
J. Pentium (586, 686)			
K. PC Lap Top			

17. Three categories of computers have been established for the state:

CATEGORY A (IBM COMPATIBLE): Pentium (586, 686) & 486.

CATEGORY B (APPLE): Mac Powerbook, Mac Power PC, Mac Quadra/Centris (68040), & Mac LCIII.

CATEGORY C (IBM COMPATIBLE): 386, 286 or earlier, PC Laptop.  
(APPLE): Mac LCII, Mac LC, or earlier Mac & Apple II, IIc, IIe, IIgs, or earlier.

Indicate below the *number of rooms* in your school connected or not connected to the Internet and the *number* of Category A, Category B, and Category C computers connected/not connected to the Internet.

LOCATIONS	Number of ROOMS		CATEGORY A COMPUTERS (PC)		CATEGORY B COMPUTERS (MAC)		CATEGORY C COMPUTERS (Older PCs)
	Connected to Internet	Not Connected to Internet	Connected to Internet	Not Connected to Internet	Connected to Internet	Not Connected to Internet	
Classrooms							
Computer Lab(s)							
Library Center(s)							
Administrative Office(s) & Other							

**APPENDIX B**  
**1997-98 *SETS* INSTRUMENT**

## **NOTE TO USERS**

**Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation in the author's university library.**

**123-125**

**UMI**

**APPENDIX C**  
**1997-98 *DERST* INSTRUMENT**

## A District Evaluation of Recently Enacted State Educational Technology Policies

The Governor's Office of Education and the Louisiana Center for Educational Technology

The following questionnaire is designed to 1) measure the changes, if any, that have occurred as the result of recently enacted state educational technology policies and 2) determine the relative benefits of newly implemented state-based technology services and requirements. Please take 20-25 minutes to answer each question by circling the number (3, 2, 1, 0) or abbreviation (DK for "Don't Know") that corresponds to your choice with a dark pencil or black ink pen.

*Upon completion, please fax the completed survey to The Governor's Office of Education at (504) 342-5326 by May 29, 1998.*

[If you have any questions, please contact the Governor's Office of Education by phone at (504) 342-1608 or by e-mail at [gagnej@gov.state.la.us](mailto:gagnej@gov.state.la.us).]

### PART 1: YOUR DISTRICT

(Please answer questions 1-18 for both the 1996-97 and 1997-98 school years)

1996-97				To what degree did the following elements exist in your district during the 1996-97 and 1997-98 school year?  Please respond to the following statements by circling a number for both the 1996-97 school year (left column) and the 1997-98 school year (right column)	1997-98			
Existed to a large degree	Existed to a moderate degree	Barely existed	Did not exist		Existed to a large degree	Existed to a moderate degree	Barely existed	Does not exist
3	2	1	0	1) Planning process whereby district periodically revisits and revises technology plans accordingly	3	2	1	0
3	2	1	0	2) A 3-5 year funding plan to support ongoing technology maintenance, expansion, upgrading, and retrofitting	3	2	1	0
3	2	1	0	3) Coordinated use of various federal, state, and local funds to support and enhance technology initiatives	3	2	1	0
3	2	1	0	4) Local school board awareness of enhanced technologies	3	2	1	0
3	2	1	0	5) Local school board support for your district's technology efforts	3	2	1	0
3	2	1	0	6) District/school accountability procedures that monitor the effectiveness of technology use by teachers and students	3	2	1	0
3	2	1	0	7) District personnel who can support and maintain district/school technical infrastructure (i.e., servers, hardware, wiring)	3	2	1	0
3	2	1	0	8) Leadership at each school to guide appropriate integration of curricula and technology	3	2	1	0
3	2	1	0	9) Ongoing technology training opportunities for teachers	3	2	1	0
3	2	1	0	10) District content standards for students that identify expected technology competencies for each grade level	3	2	1	0

1996-97				To what degree did the following elements exist in your district during the 1996-97 and 1997-98 school year?	1997-98			
Existed to a large degree	Existed to a moderate degree	Barely existed	Did not exist		Existed to a large degree	Existed to a moderate degree	Barely existed	Does not exist
3	2	1	0	11) Significant numbers of teachers (50% or more) effectively using technology with their students	3	2	1	0
3	2	1	0	12) Student use of Internet connections in classroom settings	3	2	1	0
3	2	1	0	13) Opportunities for students to apply state-of-the art technology to critical thinking and problem solving	3	2	1	0
3	2	1	0	14) Software that integrates with new state content standards available for use by a majority of your district's teachers	3	2	1	0
3	2	1	0	15) Increased classroom-based technology as opposed to lab based technology	3	2	1	0
3	2	1	0	16) Business partnerships with districts and/or schools focused on technology initiatives	3	2	1	0
3	2	1	0	17) University partnerships with districts and/or schools focused on technology initiatives	3	2	1	0
3	2	1	0	18) Regional technology partnerships with other districts	3	2	1	0

Approximately how much more (the percentage increase) did your district spend on technology during 1997-98 when compared to 1996-97?

19) Hardware/software/wiring, etc. ☐ 0-25% ☐ 26-50% ☐ 51-75% ☐ 76-100% ☐ 101-150% ☐ 151-200% ☐ 201%-more

20) Training/professional development ☐ 0-25% ☐ 26-50% ☐ 51-75% ☐ 76-100% ☐ 101-150% ☐ 151-200% ☐ 201%-more

## PART 2: RECENT STATE TECHNOLOGY POLICY ACTIVITIES

To what degree did the following contribute to changes in your district technology efforts during 1997-98 (i.e., How beneficial were they?)	Highly Beneficial	Somewhat Beneficial	No Effect	A Hindrance	Don't Know
21) Specific state-required items that <i>school</i> technology plans must possess	4	3	2	1	DK
22) Specific state-required items that <i>district</i> technology plans must possess	4	3	2	1	DK

23)	Review and evaluation of your <i>district's</i> technology plan during the state technology grant funding process	4	3	2	1	DK
24)	The Louisiana Center for Educational Technology (LCET)	4	3	2	1	DK
25)	Half-day "Technology Tools Workshops" for local educators, provided by the LCET throughout the year in Baton Rouge	4	3	2	1	DK
26)	The LCET Web Site	4	3	2	1	DK
27)	E-rate information meetings	4	3	2	1	DK
28)	Two-day institutes in support of integrating technology and the new state content standards	4	3	2	1	DK
29)	Louisiana NETDAY Teleconference	4	3	2	1	DK
30)	Extra state funding for hardware & software	4	3	2	1	DK
31)	Extra funding for technology training and professional development	4	3	2	1	DK
32)	Regional technology resource centers	4	3	2	1	DK
33)	State recommendations for a District Area Network Plan (DANS)	4	3	2	1	DK
34)	The state provided model for technology-rich schools as set forth in the state technology plan	4	3	2	1	DK
35)	State recommendations for establishing Local and Wide Area Networks	4	3	2	1	DK
36)	State recommended local & district strategies for professional development	4	3	2	1	DK
37)	State recommended local & district strategies for technology implementation and integration with the curriculum	4	3	2	1	DK
38)	State recommended local & district strategies for effective use of technology funding and resources	4	3	2	1	DK
39)	State recommended strategies for creating greater public awareness for district and school technology initiatives	4	3	2	1	DK
40)	State recommendation to participate in a regional technology cooperative	4	3	2	1	DK

41) Please identify the top five most valuable policy measures from questions 21-40. Place the specific question number in the blank accordingly.

Most valuable # \_\_\_\_\_ Second most valuable # \_\_\_\_\_ Third most valuable # \_\_\_\_\_ Fourth most valuable # \_\_\_\_\_ Fifth most valuable # \_\_\_\_\_

# \_\_\_\_\_

**PART 3: COMMENTS ON YOUR DISTRICT'S TECHNOLOGY EFFORTS**

**42) Briefly describe the factor(s) underlying your district's key success in their 1997-98 technology efforts**

**43) Briefly describe the factor(s) that hindered your district's technology efforts in 1997-98.**

**44) Briefly describe the degree to which the recent state's technology policies (in questions 21-40) have positively or negatively impacted your district**

**45) Total District Student Population (1997-98)** \_\_\_\_\_

**46) Number of K-12 Public Schools in your District** \_\_\_\_\_



**APPENDIX D**  
**HOUSE BILL - 1911**

Regular Session, 1997

HOUSE BILL NO. 1911

BY REPRESENTATIVES DOWNER, BRUN, MCDONALD, LONG, DEWITT, ALARIO, DUPRE, ILES, KENNEY, MCCAIN, MCMAINS, MICHOT, POWELL, SALTER, THOMAS, WALSWORTH, WIGGINS, LEBLANC, RIDDLE, AND THOMPSON AND SENATORS DARDENNE, BEAN, HOLLIS, LAMBERT, SCHEDLER, SHORT, SMITH, AND THEUNISSEN

# AN ACT

To enact R.S. 17:3921.2, relative to state funds; to provide for creation of the Classroom-based Technology Fund within the state treasury; to provide for deposit of monies into the fund; to provide for use and distribution of monies in the fund; to provide for creation of the State Technology Advisory Committee; to provide for a grant program to help provide educational technologies for Louisiana's elementary and secondary school students; and to provide for related matters.

Be it enacted by the Legislature of Louisiana:

Section 1. R.S. 17:3921.2 is hereby enacted to read as follows:

§3921.2. Classroom-based Technology Fund

A. The "Classroom-based Technology Fund", hereinafter referred to in this Section as the "fund", is hereby created within the state treasury for the purpose of improvement of student learning through technology within Louisiana's school districts, including charter schools approved by school district boards; charter schools approved by the state chartering authority; elementary and secondary schools operated under the direction of the State Board of Elementary and Secondary Education; elementary and secondary schools operated by Louisiana State University and Agricultural and Mechanical College and by Southern University and Agricultural and Mechanical College; elementary and secondary schools operated under the direction of the

Department of Public Safety and Corrections; the Louisiana School of Math, Science and the Arts; and elementary and secondary nonpublic schools approved by the board which are in compliance with the mandates of *Brumfield, et al. v. Dodd, et al.*, 425 F. Supp. 528, all hereinafter referred to in this Section as the "grantees". To the extent of specific appropriations therefor, funds may also be used for state-level technology infrastructure development and for oversight related to the administration of monies from the fund.

B. The source of monies deposited into the fund shall be legislative appropriation, and grants, gifts, and donations received by the state for the purposes of this Section. Monies in the fund shall be subject to appropriation by the legislature and shall be available exclusively for the Department of Education, hereinafter referred to in this Section as the "department", to administer a technology grant program. All unexpended and unencumbered monies in the fund at the end of the fiscal year shall remain in the fund. Such monies shall be invested by the treasurer in the same manner as the monies in the state general fund, and all interest earned shall be credited to the fund following compliance with the requirements of Article VII, Section 9(B) of the Constitution of Louisiana relative to the Bond Security and Redemption Fund.

C. A "State Technology Advisory Committee" shall be jointly formed by the governor and state superintendent of education for the purpose of recommending to the State Board of Elementary and Secondary Education, hereinafter referred to in this Section as the "board", appropriate procedures and guidelines for awarding technology grants as provided in this Section. The committee will be comprised of at least the following members: the governor or his designee; the state superintendent of education or his designee; the chairman of the Senate Committee on Education or his designee; the chairman of the House Committee on Education or his designee; one

member from the State Board of Elementary and Secondary Education; two members from the State Technology Planning Committee; one member from the Non-Public School Commission; one teacher; one school superintendent; one principal; one school board member; one parent; and one business representative. All members shall be appointed based upon their demonstrated competence and interest in educational technology.

D.(1) The department shall develop procedures and guidelines relative to the awarding of the grant funds, with consideration given to the recommendations of the State Technology Advisory Committee, all for review and approval by the board and in accordance with the provisions of the Administrative Procedure Act. As part of such procedures, an allocation for each grantee shall be determined using a formula based solely on student population which is developed by the department and approved by the board. The exact allocation of such funds shall be based upon the most current data available as of the effective date of this Act and shall be revised on an annual basis. As part of this formula, the total percentage of grant funds made available for students within approved nonpublic schools which choose to apply for these funds shall be no more than the percentage of students in such schools when compared to the total number of students within all of the other schools or districts noted in this Section. Any allocation initially designated for any eligible district or school which does not choose to apply, or which does not meet the application requirements within each fiscal year, shall be redistributed by the department as recommended by the State Technology Advisory Committee and as approved by the board. All grantees must submit a technology grant application which is approved by the board in order to receive the funds. At a minimum, such application shall include:

(a) The grantee's technology plan indicating how such plan is linked to the grantee's overall plan to improve student learning. For

school district grantees, the district technology plan must indicate how such plan was developed in conjunction with classroom teachers and that corresponding technology plans exist for each school in which technology is to be placed.

(b) An explanation of how grant funds will be targeted to improve student learning in a manner consistent with the grantee's technology and education plans including a statement of objectives with specific and measurable targets for accomplishment and performance indicators therefor.

(c) An outline which indicates how the grantee will coordinate all state, local, and federal monies available for technology in order to fund the grantee's technology plan over time, and specifically what items will be purchased from monies received from the Classroom-based Technology Fund.

(d) An explanation of how the grantee will train its teachers in the use of the new technology and maintain any equipment purchased using monies other than those received from this fund.

(e) Demonstration and confirmation that any hardware, equipment, or software will be placed only in classrooms or other educational settings with trained individuals or with individuals who will be receiving such training once hardware, equipment, or software is received.

(f) Demonstration and confirmation that any academic subject-based software purchased with grant funds shall be consistent with the academic standards adopted by the board.

(g) Demonstration and confirmation that appropriate policies regarding the use of the Internet in the classroom shall be developed and that access to the Internet shall be controlled by trained individuals.

(2) In addition to the requirements of Paragraph (1) of this Subsection, procedures and guidelines adopted by the board relative to

the awarding of grant funds to approved nonpublic schools shall include at least the following provisions:

(a) That any equipment and software purchased shall remain the property of the state and that such equipment and software are loaned to the school for use by their students.

(b) That any equipment and software purchased would supplement, not supplant, the level of services which would have been provided in the absence of monies received from this fund.

(c) That each school certifies in writing that they shall only use such equipment or software for secular, neutral, and non-ideological teaching purposes.

(d) That appropriate audit procedures are enacted to ensure that the aforementioned written certification is being upheld.

(3) Grantees shall be provided with various demonstrable technology implementation models focused on cost-effectiveness and maximized student impact. The department, following the provisions of the Louisiana Procurement Code, and in conjunction with the division of administration, shall identify materials, equipment, and services for which the quantity to be acquired warrants the development of state contracts, and shall develop and periodically update a schedule for these items and approved brands and vendors thereof, which shall be utilized by the grantees. Such materials, equipment, and services obtained by grantees with grant funds shall be acquired through contracts maintained by the division of administration. However, a grantee may request a brand or vendor which is not included in the schedule of approved brands and vendors if such request certifies adherence to applicable statutes governing procurement as found in Title 38 of the Louisiana Revised Statutes of 1950, as amended and is approved by the department and the board as part of the grantee's application.

(4) The department, with assistance from the State Technology Advisory Committee, shall review all applications, verify their adherence to application guidelines, and make recommendations to the board for its approval as appropriate. Several approval cycles may occur within a given fiscal year whereby funds for some grantees which have adequately fulfilled the application requirements may be granted, while other grantees may need to continue work on their applications before receiving their funds. The department shall oversee the distribution of the funds and audit expenditures as necessary to determine appropriate use of the funds.

E. These funds shall be used by the grantees to purchase various educational technologies for utilization by teachers and students for the purpose of improving student learning. Such educational technology may include hardware, equipment, software, wiring and cables, and service to install such items. Such hardware and equipment may include computers, servers, CD-ROM players, modems, printers, scanners, projection systems, digital cameras, laser discs, graphing calculators, monitors, scientific equipment, and telecommunications equipment.

F.(1) The department shall provide a report by January 1, 1998, on the status of the technology grant program to the Joint Legislative Committee on the Budget.

(2) For school years 1998-1999 and 1999-2000, grantees shall submit data on the use and impact of such technologies on student performance in their schools as requested by the department. Such reporting shall include a specific accounting of the dollar value invested in classroom activities and the dollar value invested in other educational settings, as well as reporting of actual accomplishments toward meeting their stated objectives. Annual summary reports shall be submitted by the department to the governor, the State Board of

Elementary and Secondary Education, and the legislature by September 1, 1999, and September 1, 2000.

Section 2. This Act shall become effective upon signature by the governor or, if not signed by the governor, upon expiration of the time for bills to become law without signature by the governor, as provided in Article III, Section 18 of the Constitution of Louisiana. If vetoed by the governor and subsequently approved by the legislature, this Act shall become effective on the day following such approval.

\_\_\_\_\_  
SPEAKER OF THE HOUSE OF REPRESENTATIVES

\_\_\_\_\_  
PRESIDENT OF THE SENATE

\_\_\_\_\_  
GOVERNOR OF THE STATE OF LOUISIANA

APPROVED: \_\_\_\_\_



## APPENDIX E LOUISIANA STATE TECHNOLOGY PLAN OBJECTIVES

### The Louisiana State Plan for Education Technology Objectives

#### Objective One

This first objective calls for the creation of technology-rich learning environments in all Louisiana schools that will include technology that enhances teacher effectiveness and student achievement. The plan also calls for the state to help districts provide the technical infrastructure, training, and staff needed to support educational technologies and thereby ensure equity to advanced technologies that enhance student learning to all the state's students.

There are two recommendations for the state: (1) research, adopt and periodically review the infrastructure standards that provide opportunities for interconnection between national, state, and local entities, and (2) assist local districts and schools by providing models of typically selected technology components and services selected by schools (See the state technology plan, Appendix B, Infrastructure and Illustration of Models).

For local districts and schools there are four recommendations: (1) implement a short-range planning process that addresses basic technology infrastructure (See Appendix B, Infrastructure and Illustration of Models);

(2) implement a long-range technology planning process for schools and classroom technology that addresses specific content needs and administrative applications; (3) implement a plan to equip all district/schools with technologies that will support the teaching and learning process, as well as instructional management needs, and (4) develop and maintain staff to support the technical infrastructure.

### **Objective Two**

Objective two states that all Louisiana educators will have opportunities for professional development in the use of technologies that help students meet high academic standards because technologies can only be effective when teachers have the necessary professional development regarding their integration and use.

Objective two contains six recommendations for the state: (1) establish standards for the technology competence of educators; (2) encourage colleges of education to provide significant resources to technology training for teachers that ensures they can integrate technology and instruction to promote student achievement; (3) provide incentives to colleges of education to integrate technology training in to teacher preparation curricula; (4) grant tuition waivers for educators taking education technology courses regardless of their area of certification; (5) state agencies should consult the NCATE standards for technology when establishing and reviewing pre-service and in-service teacher preparation

programs, and (6) include courses and experiences that address the ISTE standards for pre-service and in-service teacher preparation programs.

Recommendations for districts and schools include (1) integrate an understanding of state and national technology standards and competencies into professional development activities, and (2) allocate significant funds in the district plan to achieve the proceeding recommendation.

This second objective also contains two comprehensive strategies: (1) to encourage broad-based advice for teacher training regarding technology literacy that will improve student learning, formulate professional development plans with LEAs, business, regional, and university representatives, and (2) provide in-service and pre-service educators with access to professional development that prepares them to meet high academic standards.

### Objective Three

In order to assist in improving students performance, all Louisiana educators will have access to curricular materials and resources that support the use of technology in teaching, learning, and instructional management. The plan calls for the state and major education stakeholders to collaboratively develop content standards which districts can use as a resource in the development of their educational technology plans.

For the state, there are two recommendations: (1) integrate technology with state content standards, and (2) develop and disseminate materials for integrating technology with the curriculum so that districts and schools will have the resources they need to help educators and students attain needed skills and competencies.

Districts and schools should (1) develop local plans that integrate technology with the curriculum, as well as define measures for documenting student achievement levels, and (2) develop local curriculum based on state content standards for higher academic standards.

#### Objective Four

Discerning leaders at every educational and policy level will (a) choose technology policies and procedures that promote achievement by all students, including those with special needs, and (b) carefully monitor the effectiveness of technology use throughout the education system.

There are five recommended strategies for the state: (1) in collaboration with the broader education community, form a leadership structure within the state department of education to support high standards, student achievement, equity of access, and accountability; (2) encourage initiatives and policies that promote technology as an integral part of teaching and learning; (3) enhance students' learning environment through the development of technology competence standards and the revision of teacher certification requirements; (4) authorize the State

Educational Technology Planning Committee (SETPC) to continue offering its advice on state technology planning and curricular revisions to the various state educational bodies, and (5) evaluate the overall effectiveness of technology as a component of the State Accountability Model.

There are two recommendations for districts and schools: (1) cultivate technology leaders within each school and district who can guide the integration of technology the curricula, and (2) establish targets for measuring technical infrastructure, training, and curriculum.

The comprehensive strategies recommended call for (1) development of policies regarding issues of acceptable use, copyrights, security, confidentiality, and equity of access, and (2) the addition of a technology component to educator evaluations.

#### Objective Five

The state of Louisiana and local districts will encourage the efficient use of resources in a manner which ensures that all schools have access to technologies that improve student competencies.

Recommended state strategies include (1) the integration of universal service with state planning to assure equitable access to technology for all schools and students in the state, and (2) the dissemination of information regarding the consolidation and coordination of funds in order to better support local technology initiatives.

For districts and schools, there are three recommendations : (1) encourage school/business partnerships, as well as matching fund programs; (2) encourage the pooling of resources in order to provide every school the technology infrastructure needed to ensure that student learning includes skills and competencies needed in an information age, and (3) a funding schedule in district plans that provides for technology infrastructure, maintenance, expansion, upgrading, retrofitting, and inclusion in future capital outlay for new schools.

The one comprehensive strategy for objective five calls for the creative funding solutions such as a state technology trust fund, a sales tax on technology products that would be used for school technology funding, community-based funding initiatives, consolidated federal funding, special state funding, and coordinated use of 8(g) funds.

#### **Objective Six**

The Learn Commission, the Board of Elementary and Secondary Education, and Louisiana Public Broadcasting will join with districts and local schools to launch public awareness initiatives to promote support for excellence in student achievement through the use of educational technology. This will also help promote alliances between schools, districts, communities, and universities that can enhance student technology use.

Recommended strategies include (1) encouraging the major stakeholders to collaborate on public awareness, alliance building, and community outreach initiatives in order to increase public understanding of technology issues (e.g., technology related skills students will need in the workplace); (2) identify resources that will allow for the exchange of educational technology information among education stakeholders so that successful strategies and practices can be replicated, and (3) use Louisiana Public Broadcasting as a statewide educational technology resource center to disseminate information.

Districts and schools (1) inform stakeholders about public awareness opportunities and resources by developing materials in print, video, and electronic formats, and (2) plan for Louisiana NetDay in order to bring the community together in support of school technology efforts.

## VITA

In November of 1998, Jeff moved to Washington, D.C., and began working as Legislative Assistant for United States Senator Mary Landrieu, handling all of the Senator's education-related legislative issues.

While in graduate school at Louisiana State University, he worked as a researcher and policy analyst in the Louisiana Governor's Office of Education for three years (1996-98). He also taught at the Louisiana State University College of Education, where he also supervised student teachers in several Louisiana school districts. Prior to 1995, he taught English at Southeastern Louisiana University, Louisiana State University, and Saint Joseph's Academy in Baton Rouge.

Jeff was born and raised in California. He earned his Bachelor of Arts (1988) and Master of Arts degrees (1990) in English at California State University, Sacramento. He moved to Louisiana in 1990, where he attended graduate school and worked until 1998.



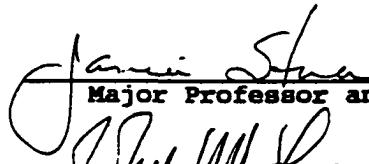
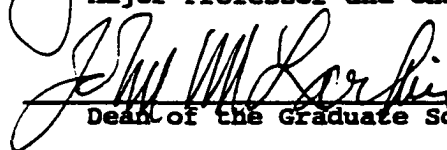
# DOCTORAL EXAMINATION AND DISSERTATION REPORT

**Candidate:** Jeffrey Paul Gagné


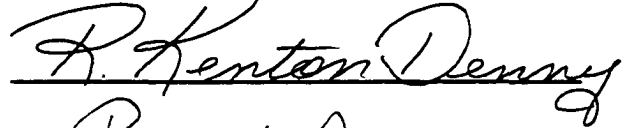
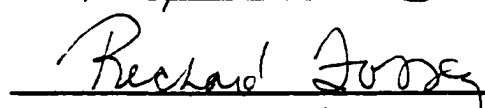
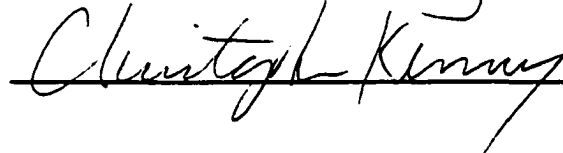
**Major Field:** Curriculum and Instruction

**Title of Dissertation:** Educational Technology and State Reform: Examining the First-Year Impact of Louisiana's State Technology Policy on Public School Districts

**Approved:**

  
Major Professor and Chairman  
  
Dean of the Graduate School

**EXAMINING COMMITTEE:**

**Date of Examination:**

September 30, 1998